

COMPUTERWORLD

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GE Adds Faster Computer to 600 Series



GE's Largest Computer Offering to date, the GE-655 is upward compatible with the existing GE-600 line of large scale information systems.

CDC Customer Contract Grants Full Unrestrictive Rights to CDC

By Peter L. Briggs
CW Software Editor

"It is agreed that no idea, concept, knowhow, or technique, resulting from programs developed by the customer to [CDC] shall be deemed confidential."

"The customer grants to [CDC] an irrevocable, non-exclusive, unrestricted, worldwide, and royalty-free license to use, copy, and sublicense the software."

Does this read like something familiar? It should, since it very closely resembles the recently rewritten IBM systems engineering services agreement before it was modified by customer demand.

One user contacted CW and pointed out the dangers of such a contract and expressed his company's inability to avoid the signing of the contract without changing manufacturers.

He felt that the eight-foot trailer reluctance to sign, when confronted with what amounts to a complete license to any computer work done by the customer, on either the systems software, or in the general field of data processing.

"The customer recognizes and agrees that [CDC] has the right to duplicate, use, and market any and all software, parts thereof or deviations therefrom which may contain modifications or improvements to be developed by [CDC], the customer, or jointly by [CDC] and the customer, and to this end the customer hereby grants to CDC a non-exclusive, unrestricted, etc.etc."

Thus, the customer can never improve on CDC's software and then go sell it, because CDC can't walk away or sell it as part of

its system.

Keep CDC in the Dark

The only way around this clause would be for CDC to never become aware of such improvements. This forces the customer to avoid using the resources available from his manufacturer to his (the customer's) best.

For IBM, with its original contract, never tried to be quite so all-inclusive in its demands.

They only wanted the software they helped develop, CDC wants everything!

This aspect of CDC's un-

bundling policy was never discussed during the company's official arbitration conference.

The company emphasized only the new hardware freedom, CDC says that any user can now tinker with his machine, for a price, and CDC will bail him out.

It avoided discussion of those areas where services were involved.

IBM was told that "These policies are not turned up yet," at that time.

Customers are not certain exactly what to do about that contract yet, but some indicated that immediate actions would be taken to ward off the impact.

This aspect of CDC's un-

PHOENIX, Ariz. General Electric has initiated the current 600 line with its fastest system to date, the 655.

Twice as fast as the company's earlier model 635, the new computer is priced to compete at the upper end of IBM's line. Costing approximately \$1.5 million, the test-unit 360/75, the new 655 is less expensive and less versatile than the 360/195 in terms of what a single central processor can do.

Improvements over GE's 635 are largely in the area of cycle time, and instruction speed, while cost is actually the same.

Cycle time is halved to 0.5 μ sec per 36-bit word, add time for a full word is 0.6 μ sec, while multiply is speeded from 7.6 to 3.0 μ sec. Storage is 256K for both machines.

Comparable Rentals

The company lists comparable "minimum configuration" rentals at \$55K per month for the 635, against \$80K for the new machine.

Users may find, however, that

prices will be a good deal higher. A 655 with full core capability and processor and two I/O controllers costs \$64K per month before any peripherals have been added.

Core is available for \$32K to the full 256K words.

At the same speed, the 655 looks quite similar to the older machine. In addition to the core, data representation is the same, and hardware is very nearly identical, with one-address instructions still in the mix.

Sixty-four 16K channels should keep any user happy, but the unchanged aggregate system transfer rate of 450,000 words/sec may be a limiting factor in multi-channel applications.

Software

The company says that all software developed for the 635 will run without change on the new processor, including Cobol, Fortran, and Algol compilers.

Also unchanged are GE's operating system Geos III, applications developed under the com-

(Continued to Page 4)

Patent Court Finds U.S. Infringed Patent

WASHINGTON, D.C. Government infringement of a recently expired disk patent became a distinct possibility, with a preliminary government hearing in a suit brought against it by Technitrol, Inc.

The suit alleges that the government is not licensed under Technitrol's 1962 patent covering a magnetic data storage system, and the trial commissioner of the U.S. Court of Patent Claims has recommended that the court conclude "as a matter of law that the government infringement did occur."

Technitrol brought suit against the government in 1964, and this year filed a class action against three major manufacturers and about 200 users [CW, July 21].

The original intent of the 1964 suit was to obtain a "test case" judgment to be followed by negotiations among individual users, according to a Technitrol spokesman.

(Continued to Page 4)

Pentagon Finds New Computer Application: Fast Scapegoat

By Joseph Hanlon
CW Staff Writer

WASHINGTON, D.C. When a pentagon efficiency expert got fired for telling about a \$2 billion contract overrun, a "computer error" got part of the blame.

Sen. William Proxmire doesn't believe it, he charged that the computer error was contrived to cover up the firing. And a Proxmire staff aide warned: "The possibilities are unlimited for using computers as scapegoats."

Ernest Fitzgerald was a Defense Department efficiency expert. In Sept. 1968, he was promoted from an untenured position to a tenured civil service post.

He testified Nov. 13 before Sen. Proxmire's subcommittee of the Joint Economic Committee that the CSA cargo plane was

to cost \$5 billion rather than the \$3 billion it was supposed to.

Twelve days later, Fitzgerald was told that his promotion and tenure were revoked because they had been given as the result of a computer error.

Later he was sent to analyze the cost of a howling alley in Thailand, and finally his job was abolished for "economy reasons."

Proxmire charged that the "computer error" was just an excuse, and part of a "series of clear reprisals" against Fitzgerald.

Defense Department Public Affairs Officer Major R. O. O'Brien told CW: "The computer was programmed wrong." But after further questioning, he conceded that it was really a "people error."

He said that a girl doing input had a list of people of whom were being given tenure and some who weren't.

The girl inadvertently included Fitzgerald with those who were being given tenure, O'Brien said.

Perfect Out

But Proxmire and his staff don't believe it. Richard Kaufman, Economic Council for the Joint Economic Committee, declared: "This is the perfect excuse for the bureaucrat - the perfect excuse for any action."

Defense Department Public Affairs Officer Major R. O'Brien told CW: "The computer was programmed wrong." But after further questioning, he conceded that it was really a "people error."

The computer was programmed wrong. Who can argue with the owner of a computer who tells you that some error was made by the machine and not by the user?

"The possibilities are unlimited for using computers as scapegoats for bad decisions."

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System/3, Part 1: The Users-to-Be Speak

Delivery Delays, Card Conversions Willingly Endured

By Frank Piatta
CW Staff Writer

The IBM System/3, in spite of delivery schedules, costs and card-conversion problems, seems to be winning many potential converts among unit-record users.

When IBM first announced System/3 last July, the indicated market was the small business firm. Four months later, all ap-

pearances seem to indicate that this target was a valid choice, with many of the potential implement looking at System/3 as a solution to their dilemma of trying to take advantage of latest technology while keeping costs in line.

With all the attention in recent years being focused on computers, it is very easy to lose sight of the many thousands of

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unit-record shops located around the country. These installations, characteristically equipped with IBM 4024, 519s, 602As and other unit-record equipment, have been supplying data processing capabilities economically to small firms.

Many unit-record users now spending \$500 to \$2,000 per month for their equipment can make the transition toward becoming a computer installation by installing the System/3.

CW has spoken with many of these small users and found that they think the System/3 will overcome the previous problems that prevented the upgrading of their operations.

Price Significant

Price is the most significant factor in the selection of the System/3. IBM has provided a typical card version, including a data recorder and sorter, will rent for \$1,185 per month.

For the first year, the \$35 per month charge that has been established for the licensing of the card version of RPG II.

These prices are reasonable, according to prospective users, in comparison with their existing equipment.

Users said slippage of schedules, cost overruns and delays to be fairly common. Of those contacted that had placed firm orders, the majority reported slips of from two to seven months. This was usually ascribed to the unexpected popularity of the System/3. Most buyers seem to be quite willing to wait their turn in line, however.

Programming costs have been reduced, in the estimation of

these prospects, by the heavy emphasis that IBM has placed on the use of RPG II as a language. Here, they feel, is a language that is not too difficult to cope with, and has been sufficiently proven to be reliable.

Most of the installations have indicated that this is the only language they are planning to use. IBM, however, claims that their own employees will be using the System/3.

The application customer service, offered by IBM in connection with the System/3, seems to have little appeal. Most of the users seem to think they can do without it.

The use of non-IBM software developed by application packages does not seem to be very popular either.

Prospective users, questioned by CW, seem to fear the loss of control that might result from the use of a software supplier not familiar with his unit-record applications.

Space Saver

The most controversial aspect of the System/3 is the new 96-column card format. This is causing some controversy among the small users.

They have been plagued for years with the problem of insufficient storage space and see the new size card as a way out.

The cost of new storage and handling equipment will be considerable, but, as one data-processing manager put it, "it's cheaper than putting up a new building."

The attitude of the user-to-be toward the question of card conversion seemed to vary considerably. Reactions ranged from

"It's a nightmare" to "We'll just ship them to IBM and have them do it." Somewhere in the middle lies the position taken by most of the prospects. They see that the conversion process will be both extensive and expensive. Some are trying to reduce the cost, by conversion to 96-column cards on the basis of minimum necessity for the transitional period. Most seem to be planning to use the facilities of their local IBM center to carry out the conversion.

The new card format justifies the added expense of memory and magnetic tape in terms of increased capacity. "We've been looking for a card stretcher for years, and it looks like we've finally found one," mused one manager. He went on to say that as their name-and-address files were presently set up, it took three cards for each entry, with all of the increased carddensity and chances for error that multiple card entries involve. He plans to reformatted this information onto one card.

All is not roses with the new cards, however. Suppliers of card-handling equipment have been active in announcing new size versions of the standard items, but some of the users are afraid that this or that or perhaps storage device will not be reduced enough in the new size, thus necessitating further changes in their procedures. One user of tablets was told by his supplier that the product might not be compatible with the new card size.

Some of the unit-record managers asked quoted still another reason for ordering the System/3: "I trust IBM more."

Managers believe they are familiar with the type and quality of the service received with unit-record equipment and expect similar support with System/3. As for other manufacturers, many of the small users echo the sentiment expressed by one man when he said that he would not consider any other but IBM because "those other outfitts are not card-oriented; they're just not familiar with our problems."

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Patent or Copyright: Part I

Users Say Program Protection 'Vital for Development'

By Edward J. Bride

CW Staff Writer

WASHINGTON, D.C. — Some sort of protection is vital if software development is to continue at any reasonable pace. That was the opinion of most of the users, manufacturers, software houses, and lawyers responding to a Patent Office request for ideas on computer program patentability.

But the method of protection varied from industry-controlled

(internal) protection, to current copyright protection, and to new classes of patent regulations covering intellectual property.

No typical cross-section could be labelled, except for patent attorneys, all of whom suggested "anything but" copyright protection.

The only alternatives to a standard form of software protection are trade secrets and the hindering of development, according to many of the re-

spondents.

They disagreed, claiming that protection was unnecessary, or might hinder software development.

A request for opinions was printed in the *Patent Office Official Gazette* on Oct. 15, 1968, but the results have just been made available.

William J. Schuyler Jr., reported that a dozen of the 34 respondents requested that their

opinions be held in confidence. Most of the 22 who permitted the publishing of their remarks appeared concerned over both the continued availability of software, and the return for the sizeable investment, in time and effort, involved in developing new programs.

User Reaction Varies

User suggestions were extremely varied, ranging from a combination of the patent and copyright rights to the dismissal of programming as the "every-day work" of the scientific and commercial world.

Metropolitan Life said that the vast patenting of programs would inhibit development and usage of programs for every-day business and commercial applications.

Metropolitan's Second Vice-President, Bert L. Neff, said that it would be better to grant a patent on a computer program, since it is no more than a mental process which is the "every-day work" of the scientific and commercial world.

Neff added that the fact that the "instructions to the computer are written in a special language does not alter their essential nature."

Western Geophysical, a division of Littton Industries, uses computers to process data in the petroleum exploration field, but derives a significant portion of its income from selling and maintaining its own programs.

The company says that protecting under existing law would be impossible to enforce and that the discovery procedure is "simply appalling."

A Western Geophysical Vice-President, Carl H. Savit, suggested that present law, which apparently entitles programs to patent protection, should be changed so that software is protected only if it is sold or licensed.

The Court of Customs and Patent Appeals has stated that a programmed general-purpose computer becomes a special-purpose computer, which "along with the process by which it operates, may be patented." [CW, Aug. 27]

Avoid Withholding Technology

Bell Telephone Laboratories suggested that portions of both the patent and copyright systems are needed, citing the need

to ensure a return to the investor and to maximize public benefit by "promoting early dissemination of the technology involved." Bell called for the copyrighting of the program itself, but the patenting of the subject matter.

General Patent Attorney R.J. Goettner said that trade secrets would remain until the situation is clarified, resulting in the withholding of "considerable technology" from the public.

Although relatively few programs would rise to a level of patentability, Burlington Industries and Leeds and Northrup Co.'s research and development departments are uncertain over the proper form of protection.

Leeds and Northrup dismissed argument over the difficulty of enforcement, stating that industrial firms usually deem it more advantageous to take a license under a patent rather than to infringe and build up potential liability while hoping not to be detected.

TRW systems group said that some sort of protection is "vital" with the alternative being keeping programs as trade secrets. TRW Vice-President R.B. Corpene said that copyright protection is presently insufficient, since it protects only the copying, and not the use of a copyrighted program.

Corpene says that protecting under existing law would be impossible to enforce and that the discovery procedure is "simply appalling."

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Strippit, a division of Houlihan Industries, called for some sort of protection, either through patenting of the entire system of machine control including software, or "protecting the software programs independently." The company deals in computerized machine control of work processes, and develops its own software.

With IBM's much-talked-about unbundling around the proverbial corner, it goes into effect Jan. 1 — the final decision on what form of protection, if any, will be afforded computer programs begins to take on added importance.

The comments of major manufacturers, software houses, and patent attorneys will be reported in the concluding article of this two-part series.

Programmatics Granted Appeal Hearing on Pi Sort Decision

By Phyllis Higgins

West Coast Bureau

LOS ANGELES. — Latest round in the Programmatics/IBM legal battle over Pi Sort and IBM's sort program, the 483, results in a decision for Programmatics.

Programmatics lost the first round at the lower court ruled that was "... a little late in the game ... to enjoin IBM from distributing something which has already been seen out in large part" and therefore there was no basis for granting an injunction at that time. Programmatics, which became a "business unit" of Data Research in August, appealed this decision while IBM petitioned that the appeal be denied.

The appeals court recently upheld Programmatics' request for an appeal and the case will now be heard before the New York Court of Appeals.

Pi Sort is a proprietary program. Programmatics claims it is expected to find a large market for it as it worked with IBM's 450 sort and greatly speeded up results.

However, shortly after Pi Sort was announced, IBM offered it to its customers without charge, an improved sort program, the 483.

Programmatics claims this has cost the company its investment and threatens irreparable harm to the firm.

Programmatics' argument claims that IBM markets four 360 systems a day which means potential revenues for Pi Sort of \$18,000 a day based on the

assumption that everyone wants or requires a Pi Sort package.

Since the start of their case against IBM, Programmatics claims they had a potential market worth more than \$2,250,000.

They contend that every user uses a sort program, and as theirs was superior to the then existing IBM product, a good market existed.

During the initial trial, IBM stated that the 483 sort had been completed one year before it was announced.

Programmatics claims that IBM announced the 483 sort right

after Pi Sort was announced.

According to Programmatics, IBM did not announce it earlier as it would have speeded up program running time, therefore costing it rental revenue.

As there was no competitor to the existing sort program, and there had been no reason to announce the new one, Programmatics says.

Since the recent unbinding announcement, IBM has stated that all new sort programs will be separately priced.

Programmatics wants the 483 sort program separately priced and also asks for damages.

GE Adds Faster Computer To Top 600 Series Line

(Continued from Page 11)

pany's pioneering work in management information systems, and other user-written applications software.

The concept of Modular design appears to be worked out in an interesting fashion, first seen on the earlier models in the 600 series.

Instead of packaging in configuration, memory increments, and I/O controller units, GE separates them.

This is said to allow the user to build his own configuration more easily and to include multiple processors and different I/O combinations where desired.

Another beneficial fallout from the degree of modularity should include easier trouble-shooting and maintenance, the company says.

Other major manufacturers' hardware offerings have some degree of modularity, at least of memory banks, but GE feels that they have carried the idea further than the others.

GE is not alone in that it has been compelled by customers willing to give it major assistance in the field of software.

GE's close association with MIT has led to the development of a package called Multics. MIT has long been a pioneer in the cooperative development and testing of multiple-user operating systems.

Court Finds U.S. Infringed Patent

(Continued from Page 11)

When it became apparent that no judgment would be awarded before the final evidentiary hearing, the court ruled (Oct. 23), that it would proceed to file its class action against Control Data, Xerox (then Scientific) Data Systems, and Honeywell, plus about 200 users, suppliers, or dealers in disks.

The company spokesman is encouraged, and says that the commissioner's recommendation will lead to "meaningful negotiations" among Technical, the government, and any other "possible infringers." He said the company hopes for out-of-court settlements, to save time,

and the court's costs.

PHILADELPHIA. — The Common Pleas Courts will be assisted by a computer in maintaining efficiency and preventing future overtrials.

Frank J. Blaker, court administrator, explained that the data processing center would store and implement new procedures and clerical functions dealing with criminal court files from the time the bill of indictment is produced to the final disposition.

At the end of the day, the results of all court activities, arraignments, bench warrant

hearings, post-trial motions, and bail charges, will be fed into the computer. That night, the information will be coded and updated for the next day's court agenda.

From the output of the computers, courtroom clerks will be able to file in cases, time schedules for each day, and appointments.

Blaker said the system was expected to ease delays, mistakes, and the general red tape associated with courtroom activities.

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DP Firms Boost Minority Groups

Project Enterprise Finances Small Business

By CW Staff Writer

WASHINGTON, D.C. — Black capitalists got a boost from the computer industry when two organizations promised over \$150,000 each to sponsor a Minority Enterprise Small Business Investment Company (Mesbic).

The Sam Wyly Foundation of Dallas and Varian Associates of

Palo Alto, Calif., were among 18 Mesbic sponsors announced by Maurice Stans, secretary of commerce, as part of Project Enterprise. Stans said that he hopes 100 companies involved by June 1970.

Under Project Enterprise, a private corporation sets up a Mesbic with \$150,000 minimum capital. The Mesbic then loans

money to finance business projects by members of minority groups.

Each loan will be matched by a government loan of twice as much, so that each \$150,000 actually represents \$450,000 in loan funds.

Wyly Heads National Group

The Sam Wyly Foundation was

created six months ago by Sam Wyly, 35-year-old president and chairman of University Computing Co. Wyly was recently named by President Richard Nixon to head the National Advisory Council for Minority Business Enterprise.

The foundation will concentrate its efforts among the black, Mexican-American and Asian-American minorities in the South.

The Mesbic has not been set up yet, but the foundation itself has guaranteed \$200,000 in bank loans to set up seven minority businesses.

The foundation also supports Ventures Advisors, a black group that provides technical and managerial assistance to these firms, and does feasibility studies of new proposals for funding.

Grants for Minority TV

In addition to funding new minority businesses, the foundation has also attempted to improve the coverage of minority groups on television. It gave a \$100,000 grant to set up a public affairs division of a local



UCC President Sam Wyly

television station, paid for the production of a series of ten 30-second color TV spots called "This is Your Heritage" on the cultural contributions of Mexican-Americans in the U.S., and sponsored a television series "The Spirit of Blackness."

The other computer firm funding a Mesbic is Varian Associates. According to John Wilcox of Varian, they have already funded several new businesses in the Palo Alto area.

Dog Bit and Ran, But Woman Avoids Rabies Shots With Detective Computer

By Peter F. Carr

Contributing Writer

CINCINNATI, Ohio — Although they are totally unaware of it, all the dogs in Cincinnati have their descriptions registered on tape in the city's computer center.

This by-product of the city's computer system was designed to issue new licenses by computer printout in order to save the city from having to type up the licenses manually.

However, a mistake was found for the system recently, and it resulted in a happy ending to the mystery of a suburban Cincinnati woman and a dog that bit and ran.

Curly, a six-month-old beagle puppy, was lying unconscious in the roadway after being struck

by an auto. Mrs. Glenda Egloff, a 79-year-old (DHD) woman, saw Curly and stopped her car to move him out of the way. But Curly recovered just in time to nip Mrs. Egloff's finger and scamper off.

Being well aware of the painful series of rabies shots given when a dog cannot be located, Mrs. Egloff enlisted the Hamilton County Regional Crime Information Center's computers to help find Curly.

Since his description and identification number and the name and address of his owner were all on tape it was simply a matter of pulling out his record by using the right modifiers. In this case the modifiers were the zip code, the breed, coded by a number, and the color, coded by a letter.

All this information was entered by punchcard into one of the three Spectra 70 computers in the Center.

The computer printed out a list of 368 dogs in the area, of which five had the general description. By further pinpointing the exact location in which Mrs. Egloff was bitten, information on 15 beagles came back.

About 38 police stations in the Cincinnati area are on line to the city's computer center and the list of dogs was immediately transmitted to the station in the appropriate area.

In a few hours Curly had been found by process of elimination. His owner had already inoculated him, so a happy Mrs. Egloff was informed that she wouldn't have to get her rabies shots after all.

Jack O'Brien says,
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December 9
ATLANTA
January 8

• PITTSBURGH
December 11
MIAMI
January 13

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Increased Computer Usage Advocated for Medi-Cal

SACRAMENTO, Calif. — Doctors from several local medical foundations here have recommended increased use of computers to police patients and doctors participating in the state's big Medi-Cal program.

They suggested that computers be programmed to provide a detailed medical history for each Medi-Cal recipient and every provider of medical services. The intent is to determine whether treatment is justified for the patient and usual for the doctor.

Dr. Donald Harrington, presi-

dent of the San Joaquin chapter of the United Foundation for Medi-Cal, said that claims are currently processed without such profiles. Harrington said that if questions arose a claim might not be paid.

Use of detailed profiles for patients and doctors has proven successful in experimental programs in Sonoma, Kern, and Fresno counties as well as in other areas of the state.

The foundation made its proposal to the California Department of Health Care Services. They are reviewing the plan.

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As a high school junior, Bruce Zak explains his computer science project at the Chicago City Science Fair.

Chicago Youth Programs at 13, Designs Award Winning Device, Studies at MIT

By H. L. Miller
Special to Computerworld

CHICAGO — As a 17-year-old youngster, Bruce Zak, a Chicago high school student, went to a small office each day to work as the youngest computer programmer in the Illinois Central Railroad's Main Central department in the Windy City.

Zak, a graduate of Taft High School, had developed an interest in mathematics and railroads early in life, along with a

keen appreciation of automation.

"When I was six," Bruce recalls, "I began to plan signal and switching circuits, some of them rather simple, for a 6-year-old. Later I was ill for some months, watched TV College on Channel 11 and picked up quite a bit of mathematics that way."

13-Year-Old Programmer

"Four years ago, at age 13, I learned to program a computer

at the Illinois Institute of Technology."

Bruce was taught the rudiments of his first computer language, Fortran IV, during the first half-hour's trip to IT's computation center. Other languages soon followed, including GPSS, ITTRAN, MAP, 360 Assembler and 6/20 SPs.

"My interests were primarily in symbolic logic as it applied to basic computer circuitry. On a modest budget and with his grade school exposure to electronics and math, Bruce designed numerous science fair, award-winning electronic devices."

Computer Builder

By his senior year, Zak's project consisted of a full-fledged relay-operated computer, designed on the basis of a 4-ivalued logic system. It had a small amount of relay memory, two I/O channels, control, and logic circuitry.

Its time base was a microprogram cut onto a Hollerith card. The card, fastened to a tin can, revolved, and the holes were sensed by paper clips making contact to the can. A similar technique was used to sync the I/O channels. They even had error recovery.

For participation in science fairs, Bruce was awarded a \$1,000 scholarship by International Harvester Co.

Scholarship Winner

Zak came to the attention of R.P. DeCamara, president of information and control systems for Illinois Central when he won a full scholarship at MIT in a nationwide competition.

On the college entrance examinations in math, he scored 800, highest score possible.

As part of his job interview at Illinois Central, DeCamara gave Bruce a problem in math which took the 13-year-old a significant half hour to solve with paper and pencil. Bruce solved it in his head in about two minutes.

Zak held a regular job as a computer programmer in the railroad's methods, systems design and programming department.

His special project was to write a graphic subroutine: to design a program to produce weekly charts of terminal performance at various yards.

These are now produced by hand. Via Bruce's program, more than 400 charts, all more accurate than those hand-drawn, will be produced in two hours on the computer.

At MIT, besides the regular freshman courses, Bruce was in a seminar on urban systems where he used the language Transet on a 360/67 to model the Boston traffic system. He took courses in automatic theory and the design of digital systems.

Bruce intends to go into a Systems program leading to degrees in both math and electrical engineering.

He hopes to go to graduate school at a science and math-oriented university and, "perhaps I'll have the opportunity to study abroad."

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Editorials

Users to Be Taken Again!

It would appear that CDC is following in the footsteps of IBM with a support services agreement that gives CDC all the benefits of any work done by either the customer or by the customer in conjunction with CDC.

IBM backed down on its attempt after only a few weeks, but CDC seems determined to forge ahead.

According to the terms of the CDC contract, software or inventions relating to data processing are irrevocably coded to CDC for its use as it sees fit.

This practice, long in dispute in other industries such as electronics, has finally come up to haunt the computer industry. Previous attempts on the part of many manufacturers of industrial equipment, have been made to enforce such agreements. The courts, CW was told, have refused to uphold such practices.

IBM has changed its systems engineering services agreement to eliminate this confiscatory clause, and has re-interpreted the intent of the agreement to clarify customer rights to privacy.

Rumors indicate that several other manufacturers may be planning similar contracts.

When a consulting firm develops software or programs for a client, all rights to that package reside with the customer unless he specifically states otherwise.

The manufacturers force a client, if he wishes support services, to give over all such rights. The company also forces any improvements in system software, etc. to be ceded over to CDC, for its use.

These manufacturers have been duly and well paid for their services. They have received all due recompense.

By what right do they demand the use of, and the rights to, such materials?

Would More Time Help?

The French have developed an interesting technique to bypass the problems of large computer and electronics shows — the exhibit part of the show goes on for about 10 days, and the technical portions are broken down, by type, into one- or two-day sessions.

This would eliminate two of the principal problems presently plaguing JCCs. Hotel accommodations and transportation planning could be distributed over a reasonable period of time. The tremendous bottleneck at airports and hotel reservation desks could be bypassed.

In addition, technical people, who certainly cannot get away for 10, or even four, days, could attend that portion of the show that involved their specific technical areas.

They would have adequate time and space to view the exhibits, they would be able to find a place to sleep, and they might even have time to participate seriously in the technical presentations. There would be more interest, on the part of those present, in the specific technical subjects "active" for that day, and they could discuss such subjects with others with similar interests.

This approach appears to offer only one serious drawback. Ten days could be pretty expensive for the exhibitors.



'I Thought Computers Were Supposed to Speed Things Up.'

Viewpoint: Thoughtful Destruction?

Use of Computers Should Benefit People

By Joseph Hanlon

CW Staff Writer

— Some will view the attack on the Dow Chemical computer center [CW, Dec. 3] as the first by the new Luddites. But the Luddites smashed machines in an effort to turn back progress. The Dow Chemicals' critics, however, destroyed the tapes but did not damage the machines.

"We destroyed information and knowledge that is used against people. The machines were not damaged in hopes that they can be used to benefit people," explained Jo Ann Miser, a member of Beaver 55, the group that erased the tapes.

But the specific contents of those tapes are unimportant. In a dramatic way, Beaver 55 has

stressed a point we often miss: computers have done very little to really benefit people or improve the quality of life.

Even in medical systems, often cited as the most humanitarian use of computers, the stress has been on accounting and billing. Medical systems have run a poor second.

Beaver 55 has hit a raw nerve in our society. Many people who do not support their tactics will realize that what they say is true. No matter how we improve the security of our computers, more attacks are sure to come, and they may not be so sophisticated.

Only by turning to systems that really do benefit people can we disarm the new Luddites.

Letters to the Editor

Employment By Handwriting

Analysis Judged Unfair

This letter is a comment on an article which appeared in your Nov. 11 issue regarding a certain Charles Martin, the handwriting seer.

I was particularly disturbed by the comment that a person's success or failure in business might depend on his handwriting. The "seer" of his "seer" so perfected that it can be turned over to a computer! On the other hand, the ludicrous suggestion that his work is parallel to a trained psychologist's analysis had me in stitches.

A respected psychologist, Kurt Lewin, warned, many years ago, about the very basis of Mr. Martin's work when he cautioned about looking at things phenotypically. To cite the classic example — youngsters who were punished either very much or very little were more likely to exhibit the same pattern of aggressive behavior in the classroom. However, the amount of phantasy aggression in a child was directly proportional to the amount of punishment they received at home. Thus, although phenotypically the two groups were identical, genetically they were very different. Yet, without, any other knowledge as to the person's

background, Mr. Martin is audacious enough to describe his entire psychic make-up by the way he does an "I".

I suggest that this is equivalent to lumping all mankind together in a group labelled "blood-bearing" — for the purpose of transfusion! On the most practical side, I would suggest that such an unfair employment practice is irrespective of its inanity — and, as such, would be a basis for bringing charges against the company employing such devices.

Donald A. Sordillo

Cambridge, Mass.

Attention Must Be Given To Computer Errors

You may consider people's customs as childish when they punch extra holes, etc., as you noted in your 8 October editorial. You may change your mind, however, when you recall the story of the soft-spoken male skinner who bopped the mule with a two-by-four. You do have to get their attention.

Richard B. Mathews

Senior Research Engineer

Southwest Research Institute
San Antonio, Texas



It doesn't hurt a Bit.

bfr

Miniature CRT Displays 'All' Characters

WHIPPLING, N.J. — A display device that is said to be capable of displaying a virtually unlimited number of different characters (including such diverse symbols as those used in foreign alphabets) on small high-resolution CRTs has been announced by Madatron Corp. of this city.

The system, which can be readily interfaced with most computers (through some extra software in the processor), is aimed at a number of applications. Uses which normally require look-up operations to determine symbolic answers can now be accessed and displayed via the CRT device. Examples include wiring instructions and commands for an operator of a machine tool. Operating system message display might be an-



Madatron Display

other use, and also mathematical formulae, the firm says.

The unit has not as yet been interfaced by the manufacturer, to a computer system, however. Basically, the unit consists of a

drum containing the desired characters (another drum can be programmed with words), a character generator, and a display unit. The latter is said to have a virtually unlimited num-

ber of display positions and possible characters.

The display is operated by a 6-bit binary code, with the computer itself storing the desired characters including those not provided by the manufacturer of the processor. The total character limit appears to be the possible number of different 6-bit combinations that can be stored.

The character display is said to cost \$35 to \$75 per CRT position, depending on the number of display characters, package requirements, and the number of systems included in the order. Delivery is currently quoted at 60 days, but the company is looking forward to shortening this time early next year.

Madatron, Inc., is located at 110 Route 10 here.

We know our optical mark readers can save you money. Just one is saving us \$32,000 a year.

We did it by cutting out the keypunch bottleneck at our Palo Alto plant.

Instead of slow, costly keypunching, we now use one of our optical mark readers. And we're already saving more than \$32,000 a year on payroll processing costs.

The reader handles 125,000 job cards turned in by 3000 employees each month. Everyone writes his own work record on a simple tabulating card, using an ordinary pencil. The process is so easy and efficient, payroll accounting is ready three days earlier than before.

And we don't build our optical mark readers just to handle payroll in plodding offices. They're rugged enough to work in machine shops, warehouses, even on construction sites. In fact, you can put them just about anywhere you need important data processing and information on material movement, order entry, quality assurance, inventory control.

New design techniques are the key to our readers' reliability. For example, we've developed a special feed system that virtually eliminates card jamming and mutilation. And a unique mark detection feature assures accurate reading of even poorly marked cards.

All our optical mark readers cost less than \$3000. That's another reason they're so easy to pay for yourself. Your local HEWLETT-PACKARD consultant can show you just how easy. Call him. Or write to: Hewlett-Packard, Palo Alto, Calif. 94304; Europe: 1217 Meyrin-Geneva, Switzerland.

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New Products

Data Set Handles 70 Terminals

WESTWOOD, N.J. — A time division multiplexer-concentrator is said to be able to multiplex or concentrate up to 70 asynchronous, full duplex, low-speed terminals to form one high-speed voice band line for public or private transmission, according to Timeplex Inc.

The unit, listed at \$16,700, includes a multiplexer, concentrator, demultiplexer, and deconcentrator, and can send and receive simultaneously, the manufacturer says.

It is said to process three or more code/speed terminal groups, and to concentrate any sets of input terminals before multiplexing them.

The major benefit of concentration is that relatively inactive



MC-70 Multiplexer-Concentrator

terminals are kept from monopolizing multiplexer channels. The company says that several units at different locations can be connected through voice-band lines to enhance configuration versatility and cost-effectiveness. Other features include automatic failure disconnect and spare unit failback, continuous hardware error testing, and programmable parity bit checking or insertion.

Options are in the areas of automatic code/speed adaptation and automatic long-distance dialing and answering.

The MC-70 is modular, selling in groups of eight lines. The smallest (eight-line) unit sells for \$5,800, going up to 70 lines for \$9,800, the company says.

Delivery is currently stated to be 60 to 90 days. Timeplex, Inc. is located at 15 Charles St.

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New Cassette Designed for Tape Drives

REDWOOD CITY, Calif. — A tape cassette designed specifically for use with cassette tape drives used in key-to-tape converters and remote terminals has been developed by Ampex Corp.

Designated the PC-800, the cassette is said to provide the greatest reliability and best tape skew and pack characteristics now available. Most cassettes now used with computers were designed for less demanding audio applications, the company claims.

J.L. Porter, Ampex vice-president, said the PC-800 employs a precision plain steel bearing mounted fixed hubs, and a four-point tape path system.

The cassette uses Ampex series 870 Cassette computer tape and each unit contains up to 300 ft of full-width tested tape, compatible with any track or machine requirements, according to the company.

The cassette will be available in January for immediate delivery. The price is expected to be below \$10, a company spokesman said.

Ampex Corp. is located at 401 Broadway here.

Adding Machines Detect OCR Print

CHICAGO — Three optical font adding machines with printing that can be scanned by OCR readers for computer input are being offered by Victor Computer Corp.

Accounting data from the units can be read in milliseconds by OCR readers that can operate on-line to computers or produce magnetic tape for later input, according to the company.

Applications for the units include chain store order control, accounts receivable and payable, investment control, payroll disbursements, and analyses for sales, job cost and expenses.

Two of the machines use a simplex tape, while the other a duplex (two total), have wide cartridges for tape or page printing. The third, a simplex, uses standard adding machine tape. The machine list and total 12 digits in each column.

The left column of a duplex unit can be used for code groups, account or item numbers, and the right column for dollars and cents. Totals on each column can be checked against the automatic computer totals to assure the programmer that all lines were read and entered correctly, the firm says.

The simplex model F1-12L with standard tape is priced at \$349; the simplex wide carriage, F1-12SL, \$570, and duplex wide carriage, F1-12SDL, \$670.

Victor Computer Corp., Business Machines Group, is located at 3900 N. Rockwell Street,

An announcement of revolutionary importance
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API PLUS is here!

5 to 12 times more powerful than FORTRAN
... easier to learn than BASIC ... and
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APL PLUS
is an ultimate refinement of a language developed and proven by IBM over the past seven years, a language which IBM itself says "has materially changed the computing habits of (our) Research organization... Staff members who resisted the use of computers have become steady users."

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is much faster to program: In the chart at right is just one example, comparing FORTRAN, BASIC and APL PLUS.

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is the exclusive product of Scientific Time Sharing Corporation, the company that added the "PLUS" to APL. Here's what we mean:

SCIENTIFIC TIME SHARING is the first company offering APL with support

COMPARISON

Computing the average of a set of numbers:

FORTRAN	BASIC	APL PLUS
DIMENSION X(1000)	DIM X(1000)	(+ / X) + pX - □
READ (2,6)IN, (X)(1)=1,N	READ N	
6 FORMAT (6, (E15.2))	FOR I=1 TO N	
S=0.0	READ X(I)	
DO 4 J=1,N	S=S+X(I)	
4 S=S+X(J)	NEXT I	
AVG=S/N	AVG=S/N	
WRITE (3,9) AVG	PRINT AVG	
5 FORMAT (E15.2)	DATA	
END	END	

Characters required:
FORTRAN-122

BASIC-75

APL PLUS-10

for large INPUT/OUTPUT FILES for commercial as well as scientific applications.

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WHY WE'VE TRAINED MEN FOR A VANISHING BUSINESS.

The unit record business is disappearing so fast it takes a service force of almost 1,000 men to keep our customers happy. There are over 6,000 customer installations, many of which run their punched card equipment day and night.

Here we are in this so-called defunct business and still we're working nights and weekends keeping up with the workload. The only thing that's vanished is the eight-hour day.

That's not all that surprising considering there are about 40,000 unit record installations in this country, with an estimated 600,000 pieces of punched card machines now in use.

With numbers like those you need a lot of well trained professionals in a lot of places. Which is why we can provide 24-hour service in more than 50 locations.

It would be nice to be in a business that wasn't always vanishing. But you get used to it. They first closed the book on the unit record business 15 years ago when IBM brought out the 650. Then came the 705. Now it's the System/3 and we are once again the Ghost of Data Processing Past.

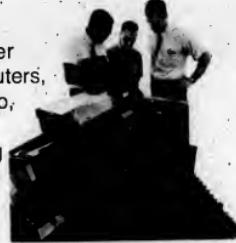
Yet everywhere you look you see those familiar old tabs and sorters and calculators,

humming away, getting the work out. Unglamorous, uncomplicated, and inexpensive. So inexpensive, that it's possible, for the price of one hour's computer time, to rent a small unit record combination for a whole month.

A lot of people know this, and a lot of people take advantage of it to get more out of their computers, and at great savings. Bog a computer down with a lot of raw data and you're likely to bog down your profit and loss statement as well.

Then there are things like computer editing and back-up. Not exactly the stuff of tomorrow's headlines, but not to be ignored either. Especially when the auditors are hanging around.

In the salons of technology they twitter about the new computers, and sometimes we do, too. But all those workaday calculating tasks keep piling up, problems in search of an economical solution. That's why all those punched card machines are still around. Along with all those well trained men to care for them. You need good men in a vanishing business.



Please send me your new unit record brochure.
 I would like to discuss my data processing needs.

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MAI Equipment Corporation
300 East 44th Street, New York, New York 10017

December 10, 1969

Page 13

System 70 Offers Real Estate Management

MIAMI - Real estate management, from raw land through housing developments or apartment complexes, is now available as either a service or a software package from Xiox International, here.

The service offers itemized control information, the company says. Each aspect of development or management has its own group of detailed and summarized reports.

The system handles multiagent, multilevel, and multiunit operations, such as apartment complexes or shopping centers. Three specific areas of reporting are lease controls, lease management reports, and general ledger reports.

Four color-coded forms are provided for input, and a simplified instruction manual for using the forms is provided, the company says. General ledger inputs come from the check register, voucher, or journal entries and require no special forms.

Detailed Reports

The lease controls section includes the issuance of lease-life coupon payment books, preparation of lease history cards for each lease, issuance of detailed reports, recording of debits and credits as either taxable or non-taxable items, and preparation of all tax information, by lease.

The management reports include an input checking report to verify input data, batch proof, control, editing of input,

CCMS Yields Performance, Cost Utilization Reports

LOS ANGELES - Summary and detailed information about how well a given computer center is being utilized is now available through the use of a new package from Computer Sciences Corp.

Known as the computer center management system (CCMS), the package provides detailed cost and performance reports on the utilization of machines, material, and personnel, according to the company.

The system has been thoroughly field tested by the company and is available for \$8,000, or \$270/mo on a deferred-payment basis. The package was developed jointly by CSC and Dylakor Computer Systems, Inc., and runs under DOS, TOS, or OS on the IBM S/360.

Under the CCMS, the package generates the Spectra 70/25 system and larger with a minimum of 64K memory.

Eleven reports are produced including, cost analysis for material, personnel, and machines, analysis of lost time by reason, resource analysis by day, transaction listing, activity histories of material, activity histories of machine showing both machine usage and personnel performance, by code, the company says.

Comparisons between monthly and year-to-date figures are included with the summaries, as well as a percentage breakdown of total costs by summary and detail elements.

The system is currently available from the company at the Century City offices here.

The company is located at 1901 Avenue of the Stars, here.

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The management reports include an input checking report to verify input data, batch proof, control, editing of input,

Cram/360 Said to Reduce 360 Storage 40%

GREAT NECK, N.Y. - Data can now be stored on ordinary file media in far less space than was normally required, said Computer Interactions, Inc. in announcing its new Cram/360 data compression, retrieval, and maintenance package.

Cram/360 is claimed to be capable of reducing the storage requirements for up to 360s, by an average of 40%. The program is currently available for both OS and DOS systems.

The package is written in Assembly language, but the company claims that it is easily

adaptable for other manufacturing machines, such as Univac, RCA, and GE. The program is said to require no maintenance at any time.

The system stores data in a special direct access library. The data is fragmented, to optimize retrieval, as well as being compressed in storage.

Compression Technique

When the source data is scanned, all blanks are deleted. Only valid data is compressed, the company says. Data is automatically decompressed upon re-

DE-03 SAMPLE LEADER 2		HIS RECORD	
CLASS	UNIT JC001	CLASS 2	PAYMENTS 11
EXCH. FEE	DATA 57232400	BILLING DATE	1/1/69
LT. & EXP. FEE	DATA 57232400	LEASE	Y/1/69
EXCH. FEE	DATA 57232400	EXPIRES	7/1/69
LT. & EXP. FEE	DATA 57232400	STATE TAX	0.00
EXCH. FEE	DATA 57232400	DEBT	0.00
LT. & EXP. FEE	DATA 57232400	BASE RENT	175.00
EXCH. FEE	DATA 57232400		
RE-NAL 66 HISTORY 66/65/65, AUTOCHANGE			
CHANGE	AMOUNT	FUNCTION	CHANGE
0	+00	CAPTURE	00
1	+00	DATA LOCKED	00
2	+00	DATA UNLOCKED	00
3	+00	BAUD SERVICE	00
4	+00	REC'D.	00
5	+00	REC'D. DUE	00
6	+00	RENT	00
7	+00	RENT DUE	00
8	+00	RENT IN	00
9	+00	RENT OUT	00
RE-NAL 66 HISTORY 66/65/65, AUTOCHANGE			
CHANGE	AMOUNT	FUNCTION	CHANGE
0	+00	CAPTURE	00
1	+00	DATA LOCKED	00
2	+00	DATA UNLOCKED	00
3	+00	BAUD SERVICE	00
4	+00	REC'D.	00
5	+00	REC'D. DUE	00
6	+00	RENT	00
7	+00	RENT DUE	00
8	+00	RENT IN	00
9	+00	RENT OUT	00

Sample Real Estate Management Form Generated by Xiox System 70

lease maintenance list; daily or weekly data posting, posting summary, trial balances, unit analysis by lease, delinquency reports, insufficient deposit reports, and suspected closed account projections.

Customized reports are available for additional cost, the company says.

The company's offices are at 8101 Biscayne Blvd. Detailed pricing for the complete package is available on request.

Accounts System Features Multi-Company Processing

OAK BROOK, Ill. - An accounts receivable system that processes on an open item and a balance forward basis is available for private users and service bureaus from Executive Computer Systems.

The system, consisting of 22 programs and sorts, is written in

Cobol and runs on any 32K

configuration with an I/O capability such as the IBM 360/30 and 360/65, the Burroughs 2200 series, and RCA systems.

Features of the system include multicompany processing; open item and balance forward accounting; within the same company; automatic calculation of trade discounts, net amounts on account; service charges; and automatic aging of accounts receivable.

Also encompassed by the system are preparation of COD invoices and monthly statements; automatic flagging of stop shipment status; the ability to apply payments to current, 30-, 60-, or 90-day balances on balance forward accounts; automatic flagging for unmapped payments for open item ac-

counts; and automatic handling of unapplied payments for open item accounts.

The system produces 16 reports, including validation reports for both product file and account master file update data, product file maintenance report, product file code book, account master file maintenance report, aged trial balance by account, inactive account report, and delinquent account report, the

firm says.

To single or private users the purchase price is \$10,000, including training orientation and documentation.

A 36-month leasing plan is available with a purchase option.

The system is operable in 30 to 60 days, according to the company.

Executive Computer Systems Inc. is located at 1211 West 22nd Street.

Programmer to Computer Gap Reduced by Fasbac

DALLAS - A package called Fasbac Fortran provides the power of Fortran computational capability to handle mathematical statements on a direct personal level, according to its developer, University Computing Co.

Through a low-speed terminal such as a teletypewriter, CRT terminal, or Selectric typewriter, Fasbac Fortran provides Fortran compiler capability. The package is available in either Fortran IV or V.

The terminal is linked to a Univac 1000 computer at UCC via standard telephone lines. The programmer may review, recall, alter, debug, and generally control the elements of a program

online from his terminal, the company says.

With Fasbac, remote users can edit, add, and manipulate Fortran programs as Fasbac edit files. Creation, modification, execution and analysis of a program can be performed on-site in the user's office, the firm claims.

The Fasbac service combines the capabilities of a time-sharing service with the features of a large-scale computer.

The charge for the service is \$7.50 per connected hour.

The Fasbac Fortran service is available nationwide through University Computing Co. computer utility centers. UCC has offices in this city.

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gram such as the ability to create new files, delete files and add, delete, insert, replace or list lines.

The revised editor package will enable Comdac-8 time-sharing system users to create and/or modify a source text file that can then be used for assembly or compilation on an on-line basis.

The price is \$1,500, including documentation, for Comdac-8 users.

Subscribers of Comsonic's

Comdac-8 time-sharing service may use the package free of charge.

The package can be modified for DEC's PDP-8 for an additional charge.

The Comsonic Corp. is located at 132 West 31st Street here.



COMPUTERWORLD

communications

British Computers Linked

Special to Computerworld

MANCHESTER, England — An experimental microwave link between two computers has been established by Imperial Chemical Industries, one of the largest computer users in the UK. The link has been used to transmit data between an IBM 360 in Manchester and an IBM 1130 terminal system, 12 miles away in Wimblow, Cheshire.

The experiment is an attempt by ICI to establish a system offering greater reliability at less

cost than the telephone links currently available from the General Post Office (the national utility which handles all postal and telecommunications facilities). These links, the only commercially available means of achieving computer/terminal communication, are both relatively slow, and susceptible to loss through noise or line failure.

If successful, the experiment could have considerable importance to UK computer users

UCC Digital Data Network Would Tie Subscribers to Local Phone Facilities

By Ronald A. Frank

CW Communications Editor

FALLS CHURCH, Va. — A microwave communications network serving 35 major metropolitan areas has been filed with the Federal Communications Commission by Datran Corporation Co. (Datran), a wholly-owned subsidiary of University Computing Co. The network would handle digital transmissions for computer users.

Although the projected microwave network had been previously announced (CW, Nov. 12), the filing before the FCC provided additional details concerning the operation of the proposed system.

The network would consist of 10 microwave repeater stations, 10 district offices for computerized switching, and "tail" circuits to customer locations. These customer links would include cable-type interconnections.

According to Datran, planned for first action use, would be figured in seconds of use rather than minutes; and it was claimed this method would cut average user costs in half compared to present common carrier facilities.

The Datran net will handle digital transmissions at rates up to 14,400 bit/sec on a switched common carrier basis, the company said, or up to 50,000 bit/sec on a private line facility.

However, in detailing plans for local interconnection loops to subscriber locations, Datran said, "the subscriber's data transfer rate will be limited by the class of service provided by the interconnecting common carrier."

Basic "network" usage rates would be scaled to transmission speeds as follows:

Bit/sec	Cost/Mo
150	\$20
4,000	\$25
9,600	\$30
14,400	\$40

Usage charges for "data units" scaled to transmission rates, monthly charges for equipment, and other charges would be added to the basic costs, according to the FCC filing.

Datran reportedly has contacted common carriers around the country including independent telephone companies proposing interconnection arrangements for local loops to subscriber premises.

The initial network would exclude service in large geographic areas such as New England, the Southeast, and Mountain and Pacific regions.



Datran data transmission network would serve 35 cities.

the computer industry's first key-to-disc data input system accepts the output from 60 or more key stations simultaneously

Time-shared input cuts data preparation costs 50%*

Now you can cut your computer input costs in half. This new innovation in data preparation techniques gives you many more advantages over conventional magnetic tape or keyboard-one-magnetic-tape-per-operator systems: (1) the LC-720 implements a computer time-shared input; (2) it is the only system available that provides direct output directly on IBM, 360-compatible magnetic disc.

By time-sharing the data from 60 or more keyboard operators simultaneously, significant savings in data station costs of as much as 50% can be achieved. Cost data is as low as \$4300 per data station for a typical 60 station system. For large data preparation installations, the time-shared input is the only economical way to go.

Data entered into the LC-720 is processed by a small digital computer and stored on an IBM,

360-compatible magnetic disc that provides the advantages of bulk storage and high speed random access data tape problems. Coupled with punched card reading or the mounting, pointing, merging and unmounting of magnetic tape reels are eliminated. All data is converted and indexed and stored in an IBM 1316 disc or in direct high speed input to your modern data processing system. Naturally, an IBM 360-compatible magnetic tape is also provided with the system as standard equipment.

The LC-720 KeyDisc System also offers for the first time data verification requiring one input pass only through the system, in addition to the normal technique of verification requiring two different operators. Record size is infinitely variable, up to 100 characters per record, 100 characters long and the system stores a large library of 30 or more different format control programs, all available simultaneously to any and all operators.

LC-720 KeyDisc System

Bring your own data for a demonstration.

Logic Corporation invites you to see an operating demonstration of the LC-720 KeyDisc System at the company's premises. Bring your own original data and let us demonstrate the use of magnetic tape of the output of your data from that LC-720 for later printout by your own computer directly.

To arrange for a demonstration, contact Gary Tischler, Director of Marketing (201) 334-3713.

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Reach System Provides Instant Access to Hospital Information

BEAUMONT, Texas - A new system designed specifically for use in hospitals, high speed computers and electronic storage equipment to create a communications network throughout the hospital.

The system, called Realtime electronic access communications for hospitals (Reach), has been developed by National Data Communications, Inc. (NDC).

The initial system was installed in the Baptist Hospital of South East Texas in Beaumont. This system is currently in the final stages of operational testing, according to Thomas W. Butler, chairman and chief executive officer of NDC.

Central, Remote Computers

The Reach system is built around a number of CRT duty station consoles and teleprinters that are located at numerous strategic points within the hospital. All input/output in the system is made through the consoles.

Remote site computers control the system in the hospital. All vital patient data along with inventories and catalogues are stored and processed here. In addition, central site computers store and process general ledger, payrolls, accounts receivable, and accounts payable.

Finally, a microfiche center produces the patient records. Four inch by six inch fiche are produced directly from magnetic computer tapes.

Fully Utilizes Facilities

The Reach system is designed for the total hospital operation from admission to discharge of patient. It also has complete data processing capability as an access to the telephone system.

With its ability to schedule services, facilities, equipment and personnel, it offers the administration opportunity for full utilization of the entire hospital. The system is designed around the patient care process. Information on a patient admitted to the hospital is entered directly into the system through a console operated by admitting personnel who are skilled typists.

From this point on, doctors' orders, diagnostic reports, or medications are implemented instantly. At the touch of a button, a nurse can schedule her patients for x-rays, clinical lab tests, physical therapy, or any other service the hospital offers right from her nursing station, without lifting a pencil.

Total Communications

Because it is a real time system, Reach offers doctors, nurses and other medical personnel total communications throughout the hospital.

A doctor, for example, is no longer required to go to a specific nursing station to view a patient chart or place an order. He can do both from any duty station console in the hospital.

A nurse can place an order for any service in a matter of seconds. From the console, she



This duty station console is the only instrument used by hospital personnel in the operation of the Reach system.

selects the patient, the doctor who is scheduling the medication, and the dosage. The medication is automatically checked against sensitivities.

Orders on Printout

With the touch of the final control button, Reach will automatically, and instantaneously, alert other departments throughout the hospital.

Applications

The pharmacy receives the order on a special teleprinter, then prints it on standard labels. The pharmacist fills the order from the printout. The order is also printed at the patient's nursing station.

If the nurse placed an order for a clinical lab test, the laboratory prints the order on a special printer of the type of test desired and the time and place for the test to be made. The order also would be printed at the patient's nursing station.

At the time the order is placed, the patient is charged for the test, treatment or medication. The patient's bill is always current.

Records Protected

The Reach system is entered by means of a specially coded badge into the console. In this way the integrity of patient records is protected. The badge is coded to the specific individual and he receives only that information that the badge entitles him to. For example, if a doctor, for example, sees an alphabetical list of only his patients in the hospital when he inserts his badge.

Records Stored on Fiche

Reach creates a permanent and complete medical record of each patient as an integral part of the system. A discharged patient's medical record is sent to the central site computer where it is stored on tape until it is completed by the physician.

The tape is then sent to the microfiche department where the records are microfiched at computer speeds by a Universal Camera capable of reading 15,000 chart/s directly from

computer tape. Each film is processed and mounted on microfiche. The 4 in. by 6 in. fiche, each containing up to 224 pages of records, are then sent to the hospital for permanent storage in medical records.

Some 18,000 pages of medical records can easily be carried in one hand and any one of these records can be retrieved in minutes in the hospital.

Contracts

NDC has signed contracts with hospitals totaling \$36.8 million for computers, their electronic equipment, and for \$19.5 with Raytheon for the specially designed terminal units, according to the company.

The CRT duty station terminals are the sole instruments used by hospital personnel in the operation of the Reach system.

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term form logical and arithmetic statements. Only a few hours of training are required for a person to be capable of using MARGEN. It is a complete system for IBM 360 Computers with a minimum of 61K under DOS or OS. It's a flexible, load and go technique for use with any information system. Find out for yourself. Call Dick for help. Or write to:



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NORWOOD, N.J. A sea-going computer is helping scientists seek answers to questions about a little-known region, the Antarctic.

The computer is aboard the U.S. Naval ship *Ethan*, now at sea on a 70-day, 6,000-mile cruise devoted to scientific research.

In probing the Antarctic, scientists use the IBM 1130 to help answer questions dealing with the formation of the earth, the effects of cold ocean currents on world weather, and the potential for commercial fishing in southern oceans.

Full-Time Research Vessel
The *Ethan*'s research is spon-

sored by the National Science Foundation's Office of Antarctic Programs. The ship is manned by a civilian crew and carries a complement of 38 scientists.

Technical support for the ship's scientific equipment, including operation of the computer, is provided by Alpine Geophysical Associates of Nor-

wood.

Nautical Data

As the ship is sailing, data is constantly input describing the earth's magnetic field, the depth of the ocean bottom, the configuration of the subbottom layers, sea-surface temperature, and gravity values.

The ship is periodically stop-

ped to gather acoustic information, bottom cores, water column velocity, salinity, and temperature and bottom photographs.

This data is all stored aboard the ship; some on magnetic tape, but most in the form of analog records. A few physical samples are also stored.

Data Processed on Ship

"Onboard processing of this data by the computer will enable us to refine the experiments while they are in process," said Walter J. Gould, port administrator for Alpine.

"Processing the data by hand, or transmitting it to shore based computers for processing is no longer necessary."

In addition, about 100,000 man-hours are saved in a year by the use of the computer, a spokesman said.

All records are reduced to computer inputs, either by means of magnetic tape direct input, analog-digital table convertor, or in the case of bottom samples, by a laboratory measurement and key-punched parameters.

The IBM 1130 then reduces all the data and relates it to a geographic position from known time.

Results of Experiments

Final output results vary with the type of input. The magnetic field readings are reduced to anomalous values above or below the mean computed main magnetic field of the earth by geographic position.

This results in a listing of anomaly by position or a plotted chart with values.

A continuous profile of the ocean bottom is produced related to position, along with a chart of depth values. A similar output, without the chart, is produced for the subbottom layers.

Sea-surface temperature values are related to position and gravity values and reduced similarly to magnetic values.

Vertical profiles of the ocean and its immediate bottom are also charted.

Fishing Potential

Specimens of marine life studied by the researchers may help determine the Antarctic's potential as a fishing ground. To date, with the exception of whales, the fish has been largely ignored by fishermen because of its remoteness.

The *Ethan* has dredged up clues to the distant past, the fossil remains of animals known to be of African origin. While these animals were amphibious, there were not swimmers. This suggests that the two continents were joined.

The computer will help to speed the processing of data from navigational satellites.

Exact positioning of the ship is important for scientific research.

In the Antarctic region, conventional navigation is difficult because of long periods of cloudiness.

All the information is finally assembled in reports, producing a total picture of the ocean examined during that cruise.

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*CPU Management Advisory Corp. is a wholly owned subsidiary of Commercial Programming Unlimited, Inc. a publicly owned company.

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Adapso Elects Officers, Board; Roy New President

NEW YORK — The Association of Data Processing Service Organizations (Adapso) has announced its officers and board of directors for 1969-70, elected recently at the group's eighth annual meeting.

Officers are: President, John L. Roy; president of Randolph Data Services, Inc., Cincinnati; Vice-President, Bernard Goldstein, president of Goldstein Management Services, Inc., New York; and Treasurer, T. J. O'Rourke, president, Tymshare, Inc., Palo Alto, Calif.

The board includes, in addition to the three officers, J. Van Horn, president, CTSS and VIP Systems, Inc., Washington, D.C.; K.R. Johnson, president, Data Management, Inc., Minneapolis;

H.W. Robinson, vice-president, Control Data Corp., Minneapolis, Minn.; D.C. K. Young, president, Data Link Division, University Computing Co., Dallas; R.D. Caldwell, president, Data Systems, Inc., Minneapolis; M. Pfeffer, executive vice-president, Statistics for Management Data Processing Co., New York; A. Steinhardt, chairman of the board, Data, Inc., New York; E.T. Sutera, president, Management Services, Inc., Atlanta; F.R. Lautenberg, executive vice-president, ADP, Clifton, N.J.; and L.J. Palmer, president, CompuTerminal, San Francisco.

The 235-company society reported a 40% membership gain and a \$20,000 treasury surplus for 1968-69.

societies

Process Control Languages Featured on IEEE Cassette

NEW YORK — Cassette Colloquium, a project designed to make current information in technology available to a wide audience through the use of compressed speech tape recordings has been inaugurated by the educational activities board of the Institute of Electrical and Electronics Engineers (IEEE).

The program is designed to supplement, rather than supplant, techniques currently used

for communicating with the society's large membership. Its principal feature is tape recordings in cassette form of special workshops and seminars for which other material is unlikely to be readily available.

The first available recording covers a recent workshop discussion on the current status of languages for process control, entitled "Industrial Programming Languages" or IPL-69.

According to J.M. Kinn, IEEE director of educational services, the electronic speech compression technique used accelerates the delivery of the speaker without distorting the pitch of his voice. Used in conjunction with careful copy and tape editing, he said, this approach is permitted compression as a 2 1/2 hour presentation into about 75 minutes.

The institute anticipates producing a continuing series of the cassette recordings and is currently working on a second presentation dealing with mini-computers.

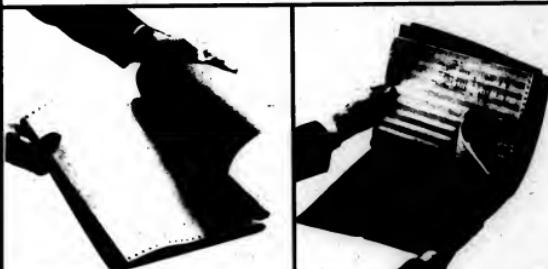
In addition, they plan to offer a coordinated package of taped commentary and visual material: Current plans include a series selected from the IEEE 1970 International Convention and exhibition. Subjects from the technical will be recorded during the convention and offered soon after in conjunction with a complete set of the authors' visual material.

Kinn said that eventually the society hopes to be preparing one program a month for distribution.

The cassettes, he said, are compatible with the machines of almost any manufacturer and lend themselves to "easy use at home or in an automobile."

Copies of the IPL-69 package are available for \$6.00 to members and \$10.00 to nonmembers from IEEE headquarters at 345 E. 47th St., New York, N.Y. 10017.

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Medical Manikin Modified To Expand Capabilities

AZUSA, Calif. — Sim One, the computer-controlled patient simulator at the University of Southern California School of Medicine [CW, Sept. 4, 1968], is undergoing modifications to expand its capabilities as a medical teaching tool.

Conceived by USC medical education researchers and designed by the electronics division of Aerojet-General Corp. in 1967, the medical manikin duplicates many symptoms and physiological functions of human patients. It was first used to train residents' physicians' difficult anesthesia skills.

Development of further applications for the "imaginarily invalid" were soon plagued by a shortage of funds. Now, a \$365,195 research grant to the USC medical school from the U.S. Public Health Service has made more sophisticated modifications possible.

Under the follow-on program, the simulator will be fitted with a new right arm and a special-purpose, portable computer to extend its applications to training nurses, interns, medical students, and hospital ward attendants.

Sim One originally used a hybrid system which will now be replaced by a Honeywell 2000.

The manikin will still have identifiable "muscles," "nerves," "bones," and "pulse," with internal instrumentation to identify and measure the quantity of three different simulated drug injections. Modification will also be made in the computer program to cause the simulator to respond with the proper pharmacological and physiological reactions to these drugs.

Stethoscopes and blood-pressure cuffs will be used on the flexible new arm, and it will be possible to withdraw "blood" samples by venous puncture. During an injection, Aerojet-General says that instrumentation in the arm will detect and report contact with bone and nerve areas and the arm will jerk to signify discomfort.

All previous capabilities of the simulator will be retained.

The alterations are expected to be completed by summer. Then the modified manikin will be moved to the Los Angeles County-USC medical center for a two-year program of research, development, and training.

studies to determine the feasibility and cost efficiency of training the new groups of health-care personnel in a wide variety of tasks.

The modification work is being conducted by Aerjett's computer sciences department. Project manager is A. Paul Clark; Leonard Taback is project manager.

Principal investigator for the three-year program will be Dr. Stephen Abramson, USC professor of education and head of the division of research in medical education. Dr. J.S. Denmon, co-director with Abramson of the initial Sim One project, will serve as a consultant on the new program.



education

GE Releases Introductory Computer Film for High School, College Use

SCHENECTADY, N.Y. — A new title, "You and the Computer," has been added to GE's catalog of educational films.

The 16mm sound and color film is designed to acquaint the viewer with a computer's function and to acquaint students in computer-oriented schools.

Using the instance of a pay-check as a framework, it compares the speed and efficiency of a computer with the laborious

task of a similar manual operation.

Directed at students in secondary schools, colleges, secretarial and business schools, data processing schools, and educational television programs, the film runs for nine minutes, combining live action and animation.

Further information is available from General Electric Educational Films, 60 Washington Ave., Schenectady, N.Y. 12305.

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RE: B-3
from: J.S. Denmon
subject: Communications System Reconsideration
date: October 1, 1969

I've been doing some analysis on the system reconfiguration we've proposed and thought you might be interested in the results.

CURRENT LAYOUT



PROPOSED LAYOUT



CURRENT MONTHLY MILAGE COSTS FOR A SIMPLE 3000 CS LINE (Interstate)

First 100 miles	Next 150	Next 500	TOTAL COST
\$110	\$105	\$412	\$1100

TOTAL MONTHLY MILAGE COSTS FOR CURRENT SYSTEM: \$1100 x 1,000 miles = \$1100

TOTAL MONTHLY MILAGE COSTS FOR PROPOSED SYSTEM: \$1100

SAVINGS PER MONTH WITH PROPOSED SYSTEM: \$1100 - \$1100 = \$0

TOTAL COST OF CODE 31-4 TERMINAL (AB-96, TS-4)

\$11,974 (AB-96) - \$0.070 (TS-4) = \$11,046 per terminal

TIME NECESSARY TO RECOVER INVESTMENT:

\$36,000 per CS-3000 line - \$0.070 per mile per month = \$52,000

\$52,000 / \$36,000 = 1.44 months

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New Books

Real-time Data-processing Systems: A Methodology for Design and Cost/Performance Analysis, by Saul Stimer, McGraw-Hill Book Co., 256 pages, \$13.50.

This book is designed for data processing practitioners who are interested in calculating and optimizing the performance, per dollar of real-time systems, typified by message-switching and automated airline-reservation systems. The author develops a broadly applicable methodology that can be used to construct cost and performance relationships for each application. The appendices include definitions of technical terms, a glossary of symbols used, discussion of queuing theory, a brief intro-

duction to probability and the use of probability tables, and derivation of equations.

Applied Linear Programming, by Norman J. Drueck, Addison-Wesley Publishing Co., Inc., 230 pages, \$11.50.

The book describes how mathematical programming techniques and especially linear programming can be applied to operational problems. Since the original development of linear programming, its practical uses have grown at an unprecedented rate. While linear programming has been applied to a wide variety of problems having different common denominators, it has been the development of mathematical models of operations and the use of standard general-purpose solution routines. The

volume emphasizes the development of linear programming models and the application of these models to industrial problems.

Principles of Automated Information Retrieval, by William F. Williams, The Business Press, 475 pages, \$15.

This book discusses the techniques and background needed for proper implementation of an information retrieval system.

It encompasses a fundamental training course for information retrieval specialists, as well as illustrating techniques and equipment available to the faculty design of an information retrieval system. The book describes implementation of small-

and large-scale systems and includes advanced treatment of information measurement systems, retrieval programs and data bases. It contains over 225 illustrations, flowcharts, mathematical formulas and graphs, and pictures of EDIF equipment.

Management and the Computer in Information and Control Systems, by Bartow Hodge and Robert N. Hodgson, McGraw-Hill Book Co., 282 pages, \$13.50.

This book is designed to bridge the gap between the manager and the computer expert in problem definition and communication, as well as to provide a basic framework that the manager can use to define and analyze his systems requirement. It

consolidates several proven concepts and introduces various new ones, which are put together to form a meaningful package of state-of-the-art methods that will help the operational manager make maximum use of the computer.

Fundamentals are described and shown in their application to the management environment. Case studies are used to illustrate the application of the tools and techniques for showing the manager how to begin applying them to his own area of concern so that he may state his requirements to the computer expert in meaningful terms.

Condensed Computer Encyclopedia, by Philip B. Jordain, McGraw-Hill Book Co., \$30, plus \$1.50 postage.

This encyclopedia, alphabetically arranged and cross-referenced, is designed to meet the needs of the businessman who has to (or wants to) deal with computers, the student who needs to use a computer, and the computer programmer about to embark on a career.

Basic entries, such as "computer," are described in layman's terms, while more complex entries, such as "overlay," make fuller use of basic computer terminology.

Entries are developed from easy-to-understand definitions to more advanced concepts. They are illustrated by means of an application or a worked-out example, whenever feasible. The encyclopedia covers as many words as may normally be encountered in a computer center and features descriptions of programming languages from Algol to Telcomp.

How to Use the Computer in Business Planning, by Dr. Henry F. Lende, Prentice-Hall, Inc., \$19.95.

This book, developed for use within IBM, shows how to develop creative and practical plans that support achievable goals, plans that foster coordinated decision-making in a decentralized management hierarchy.

It describes a divisional model within a corporate planning system and includes the functional models within a divisional planning system. It shows how the corporate system would function to help evaluate the effects of revised forecasts.

It gives staff planners and managers all the material necessary for a complete systems development effort, as well as the pitfalls to avoid. This handbook is fully illustrated with reproductions of planning statistics and worksheets as prepared by such a computerized system.

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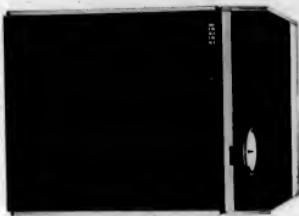
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Disk Speed	2400 rpm	
Number of Heads	10	
Number of Disk Surfaces	10	
Data Transfer Rate	156,000 bytes/sec	
Operating Environment	60 to 90 F, 8% to 90% RH	

714 DISK STORAGE DRIVE



Access Time	Track-to-track	10 ms
Average	32 ms	
Maximum	60 ms	
Start-Up Time		20 sec
Storage Capacity	29 million bytes	
Disk Speed	2400 rpm	
Number of Heads	20	
Number of Disk Surfaces	20	
Data Transfer Rate	312,000 bytes/sec	
Operating Environment	60 to 90 F, 8% to 90% RH	

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ISS
Information
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Systems, Inc.

December 3, 1969

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1st Product, 1st Month: \$2 Million

ASHLAND, Mass. — Nortec Inc.'s first product, a mini-line printer priced at "under \$6,000 at moderate OEM levels," racked up sales of over \$2 million in its first month on the market, according to the company's president, Seldon Lazarow.

The Nortec 2000 operates at 200 lines per minute, and the company says that it fills the gap between expensive high-speed units and teletypewriters.

The company has now need that it has a letter of intent for a proposed \$1.5 million financing from Murray, Baber & Currie, a New York investment firm. The additional capitalization will be used "to assure Nortec's ability to provide an expedient and efficient manufacturing capability."

Nortec is presently headquartered at Ashland, and is currently negotiating for a substantially larger facility in the same area for occupancy in early 1970.

Com-Share to be Acquired By Computer Complex, Inc.

HOUSTON, Texas — Computer Complex, Inc. and Com-Share, Inc. have agreed to merge, with the issuance of 1.5 shares of Computer Complex, Inc. common stock in exchange for each share of Com-Share, Inc. common stock.

The proposed combination of companies is subject to the signing of a definitive initial agreement to be followed by documents specifying the same terms and several conditions deemed to be in the best interest of the surviving company.

Under terms of the agreement, the timesharing operations of Computer Complex will be merged into Com-Share which will operate as a wholly-owned subsidiary of Computer Complex, Inc.

Robert F. Guise Jr., president of Com-Share, Inc. will become chairman of the board of Computer Complex and Robert A. Westerhouse, president of Computer Complex, will be president and chief executive officer of the surviving company.

Richard C. McCall will be president of the timesharing company and executive vice-president in charge of operations of Computer Complex. C.H. McCall will be executive vice-president and financial officer of Computer Complex.

Computer Complex has 1.3 million common shares and 200,000 convertible preferred shares outstanding.

Com-Share has 740,000 common shares outstanding and, on a fully diluted basis including convertible debentures, options, and warrants, would have 1.2 million shares outstanding.

Com-Share is headquartered in Ann Arbor, Mich., has computer centers in Ann Arbor, Los Angeles, and in New York, N.Y., and provides timesharing service in 34 cities in the U.S. and Canada.

Computer Complex, with headquarters and computer center in Houston, provides timesharing service in 18 cities. The company's computer will provide increased national timesharing coverage because the companies do not operate in the same areas to any substantial extent at this time.

In addition, Computer Complex is involved — through its subsidiaries — in the design and manufacture of computer communications equipment (Computer Communications Logic, Inc.); in the leasing of computer communications equipment (Computer Equities, Inc.); and in supplying specialized computer services to the oil and gas industries (The Analysts, Inc.).

Aries Corp. Anticipates Recovery From Bad Times

FAIRFIELD, N.J. — Aries Data Centers Inc. has reported on behalf of its corporate office, "that Aries Corp. has recovered from a period of substantial losses."

Aries Corp., headquartered in McLean, Va., reported profits of \$37,731 (3 cents per share) on sales of \$1,329,536 for the first quarter of its fiscal year ended Sept. 30.

The company also said it had a backlog of work amounting to more than \$4 million and "the highest level of working capital, more than \$1.4 million, in the firm's history."

Earlier, for the six months ended June 30, the company reported it had achieved a net profit of

\$3,818 on sales of \$2,837,124 compared to a loss of \$101,130 on sales of \$2,797,823 for the same period of 1968.

The first three months of 1969 showed a loss of \$34,970.

Last May the company became a subsidiary of Automation Technology, Inc. when Aries purchased Autotech Systems Corp., a wholly-owned subsidiary of ATI. The stock transaction gave ATI more than 50% control of Aries.

Ates, from its corporate office in McLean, has 100 operating divisions located in the metropolitan areas of New York, Philadelphia, Chicago, Washington D.C., Minneapolis, Los Angeles, and San Francisco.

Mohawk Data Sciences Expects Record Revenues in 1st Quarter

HERKIMER, N.Y. — Mohawk Data Sciences Corp. preliminary figures indicate that first quarter revenues will reach about \$24 million, including \$7.9 million from rental equipment.

V.E. Johnson, chairman and chief executive officer, told shareholders at the company's annual meeting that "his should result in after-tax profits of at least 35 cents per share, including a gain of about 5 cents per share from the revaluation of foreign currencies."

Johnson noted that all divisions and subsidiaries, both domestic and foreign, contributed to the expected gains.

"Actual figures for the quarter will be released after the final consolidation, which should be soon," he said.

In the comparable quarter a year ago, MDS reported total

revenues of \$11,660,000, of which \$4.1 million came from rentals and service. Earnings in cents per share were 21 cents per share, including a benefit of 3 cents per share from the utilization of tax carry-forward losses.

Lease-to-Sales Ratios

"Because of the high cost and limited availability of money," Johnson stated, "the company's lease-to-sales ratio has continued the trend exhibited in the fourth quarter of fiscal 1969."

"To stabilize this ratio at more normal levels and thereby cushion the impact of such externally-generated fluctuations on earnings growth," he said, "management has initiated a program by which a portion of rental equipment may be sold periodically to a third party con-

cern as deemed advisable in the light of prevailing monetary conditions."

During the first quarter, about \$1 million in sales were realized from this source.

Johnson also said that notification had been received from the U.S. Patent Office that a patent will be issued in the near future covering the basic key-enter functions performed by its Data-Recorder line of keyboard-terminal tape data entry machines.

The company intends shortly to file a registration statement covering the sale of about \$25 million of convertible debentures "to finance the growth of our rental program and repay high-cost bank debt," he said.

Further, Johnson said, the company is planning to file for a listing of its common shares on the New York Stock Exchange.

Scientific Resources Plans to Double Revenues From Computer Oriented Units

NEW YORK — Scientific Resources Corp. plans to double its revenues from the computer industry in 1970 to about \$12 million, up from about \$6 million in 1969. Computer-service and computer-oriented financial services are expected in 1969, according to Thomas T. Fleming, president.

In addition, revenues from the Land Resources Corp. subsidiary are expected to increase to \$40-\$45 million, up from about \$30 million in the prior year, he told the New York Society of Security Analysts recently.

Fleming recently announced the company's competing arrangements for investment in a new European company. The agreement, he said, has been signed and provides the basis for a systems and software operation in various overseas countries.

Scientific Resources will own 25% and the balance will be held by private European groups. Scientific Resources, Fleming said, will have a technical agreement whereby the company will develop software that is to be marketed, together with other software, by the new venture. Initial capitalization will exceed \$3 million.

In tracing the growth of Scientific, Fleming pointed out that the company's technical staff has grown from 100 to over 600 people, and the company had successfully made the transition from what was, in effect, a holding company to an operating company as well as accomplishing an extensive financial restructuring program — all in 12 months.

Scientific Resources Corp. was formed about a year ago when a finance company and a small software company formed the present company.

In the past 18 months, Fleming said, "We raised over \$56 million of new money, used stock for the purchase of about \$4 million worth of assets, and arranged additional financing for about \$3 million."

"Currently," he said, "we paid down about \$29 million in debt and our net worth increased from about \$30 million to about \$50 million and we are presently negotiating to convert our remaining financial operating companies — Atlas Financial and West Jersey Title and

Guaranty Company — into investments."

This has been accomplished while simultaneously acquiring companies in both the computer and land fields for stock.

For the last two years, Fleming said, the company has been involved in the full spectrum of expanding and maintaining a high-technology, people-oriented company, "securely based in tangible assets and capable of filling the huge gap that exists between computer hardware technology and the user's ability to apply it."

Computer Technology Sale To UCC Appears Imminent

By a CW Staff Writer

DALLAS — The on-again, off-again sale of Computer Technology, Inc. appears to be coming to a final decision. After negotiations with Prudential Insurance were terminated, University Computing Co. has apparently come up with a package satisfactory to UCC Chairman Sam Wyly and the seller, LTV Aerospace.

The major point of the agreement is that the seller (and major user of CTI's facilities management services) is guaranteeing a minimum annual profit to CTI after the sale becomes final.

The deal is in two sections. The first involves about half of LTV Aerospace's 71% ownership of UCC to be in three subsidiaries.

These are Academy of Computer Technology Inc., Alcorn Combustion Co., and Bell Equipment Corp. Also involved in this first phase is the payment to

LTV of about \$20 million in

The second part of the full purchase is said to be a transfer of \$25,000 UCC shares to LTV. This would make LTV Aerospace a major holder of UCC stock.

The guaranteed profit would come from a 10-year contract for the continuation of services provided to LTV by CTI. This business, currently valued at about \$40 million per year, could be expanded to include services to those subsidiaries not currently covered.

The full transaction is worth some \$130 million, including the \$20 million cash, the subsidiaries valued at \$25 million, and the \$25,000 shares of UCC, valued at nearly \$82.5 million as of the Nov. 28 closing price of 99-1/8.

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It also has HP's exclusive trouble-free design and rugged construction, with cast aluminum frame, automatically milled to precise reference planes. The tape transport components are mounted to this frame on precisely indexed bosses to assure that tape path tolerances are routine. The HP 7970 also has electronic deskew, direct drive motors, single capstan, and dynamic braking that eliminates mechanical adjustments. Plus

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So if you want a low-cost digital tape drive with HP quality, call your Hewlett-Packard field engineer for more information on our new 7970. Or write: Hewlett-Packard, Palo Alto, California 94304; Europe: 1217 Meyrin-Geneva, Switzerland.

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UTE Establishes New Core Stack Facility

ASBURY PARK, N.J. - United Telecontrol Electronics, Inc., is establishing a wholly owned subsidiary company, UTE Trin-

Expansions

dad Ltd., at Port of Spain, Trinidad, to produce memory core stacks and planes for its own use and for sale to other users.

The additional facility, according to a company spokesman, was made necessary by the company's expanding volume of memory systems for the computer and peripheral equipment industries.

He also said that although the company's main manufacturing plant in Asbury Park, N.J., is able to handle the current business volume, production demand in the future will require additional core stack capacity.

He said the new Trinidad plant, expected to start up in January, will also enable UTE to step up its marketing of core stacks and planes as separate items. The company, along with its line of complete memory systems, has been producing core stacks for internal use for some time.

Along with its memory line, UTE also produces a modern line of computer memory expanders, and a variety of manual entry memory systems. The company also is a supplier of aircraft radar transponders, heat sinks, and electronic test equipment.

Com Comp Makes Move To Larger, Modern Plant

HAUPPAUGE, N.Y. - Com Comp, Inc. has moved its research and manufacturing facilities into a newly constructed plant here. The new building is at 1324 Motor Parkway.

The move was made necessary by the rapid growth of the company and the need for additional space required when full-scale production begins in the near future.

The company develops, produces, and markets special-purpose communicating computer systems. The first of its special-purpose computer systems, the Com Comp I, is a real-time, on-line, real-time system, has already been tested successfully, according to a company spokesman. He said that the Com Comp I is a new concept in computerized information handling for clinical pathology laboratories.

Other Expansions

Keystone Computer Associates, Fort Washington, Pa., a subsidiary of University Computing Co., has announced the formation of a Chicago branch office.

Applied Logic Corp., a Princeton, N.J., time-sharing company, has opened three new offices. The western service office is located at Suite 412, 1625 The Alameda, San Jose, Calif. 95126. The Los Angeles service center is at Suite 209, 4311 Wilshire Blvd. The San Francisco center is in the Aetna Life & Casualty Bldg., Crocker Plaza, 600 Market St.



COMPUTERWORLD

emerging enterprises

Data Bank Specializes In Storage and Retrieval

NEW YORK - Data Bank Corp., headquartered at 369 Lexington Ave., is entering the information (digital, textual, audio, pictorial, and analog) storage and retrieval business utilizing a photo-optical random access memory with multi-billion bit or multimillion, document capacity.

The corporation will be using its own designed microfilm automatic retrieval and storage system.

Data Bank Corp. plans to offer the following services: data entry, management or turnkey operation, including problem analysis, the design of or incorporation of an existing file system, the conversion of the file, and the continuous maintenance of the final system; time-sharing services, including real-time retrieval of records on demand; and, through a network of remote power complexes with hard copy a by-product; and system consultation, to solve records and management information problems.

Data Communications Company is Formed

WESTWOOD, N.J. - Timeplex, Inc. has been formed to develop, produce, and market data communications products.

Sidney J. Kaplan, president of the newly organized company, stated that the company's primary objective is to "fill the void between the specialized requirements of the computer industry and the available data services of the telephone and telegraph companies".

The company's line of multiplexer-concentrator effects user savings in maintaining a large number of main computer terminal devices over a standard voice grade telephone line, he said.

These first product lines feature integrated circuit design effective in implementing multiplexing techniques.

Other New Companies

* Maryland National Corp. has announced the formation of Maryland National Optimization Services, Inc., a joint venture with Corporation S. Dallas, Texas.

The company will offer optical reading, input automation services called "Optimization" to companies and governmental agencies in Maryland, Virginia, and the District of Columbia.

* Applied Cybernetics Corp., Princeton, N.J., specializes in engineering and scientific applications of computers. The new firm will offer consulting and software services to industry and government.

In addition to software, Applied Cybernetics will emphasize the development of new products for information processing.

* Unicom, Inc., headquartered in Fairfield, N.J., will design,

manufacture, and market components for the computer industry. Plans call for Unicom to introduce a desk-top office data processing system early in 1970.

The company states that it has developed techniques that will make it possible for engineers, scientists, small businesses, and banks, and accountants to afford and operate a data processing system of their own.

Fundamatics Offers Back-Office Services

LOS ANGELES - Fundamatics, a division of Data Corp., has opened its doors in four major cities, offering complete computerized back-office services to the nation's mutual fund industry.

Back-office services refer to all clerical and accounting procedures necessary for keeping track of shareholder records, fund distributions, store, and update all data involving mutual fund transactions.

Fundamatics is involved in back-office procedures such as: transfer agent; dividend disbursing agent; dividend reinvestment agent; redemption agent; shareholder service and accounting; distribution and accounting; commission accounting; tax data; blue sky analysis; sales, marketing data and statistics;

proxies and bulk mailing services; cumulative discount.

Additional Fundamatics' services include: daily portfolio pricing; portfolio analysis; Keogh accounting; microfilming; and profit sharing and retirement plan.

Headquartered in Los Angeles, where its own computer facilities are located, Fundamatics maintains service offices in San Francisco, New York, and Chicago.

Information Displays, Inc. Forms British Subsidiary

MT. KISCO, N.Y. - Information Displays Inc., specializing in displays and communications, has completed the formation of Information Displays International Ltd., a British corporation, to be owned 80% by Infor-

mation Displays and 20% by Staketronics Ltd., a British firm specializing in computer technology.

The new company will make IDI's "Idiom" interactive graphic display systems as well as other IDI products for sale in European markets other than the United Kingdom.

Kenneth L. King, president of IDI said that IDI is expected to provide IDI with substantial commercial advantages in foreign markets.

The managing director of IDI is Kenneth E. Groves, founder of Staketronics.

The company is used for research and in industry for simulation, computer-aided design, data retrieval, market analysis, production control, and management planning.

Amazing Miracl.

Nothing can free your programmers from clerical detail and help them do bigger and better things like Republic's new Cobol program generator.

What it can do for you.

MIRACL/CPG is a powerful programming system that drastically cuts programming time. Up to thirty Cobol statements are replaced by one MIRACL/CPG statement.

MIRACL/CPG is fully compatible with Cobol. So your programmers don't even have to learn a new language to use it. In fact, programmers use MIRACL/CPG after a few hours of instruction.

Which means your programmers will be free to think about systems and program logic instead of punctuation and syntax.

And that's what it does.

MIRACL/CPG helps you generate any Cobol program faster and more easily. Small programs and large. Simple and complex. And you can insert Cobol statements at your option to modify the MIRACL/CPG generated programs.

MIRACL/CPG makes Cobol systems a reality by simplifying file management and the generation of personalized management reports. An additional feature makes it easy to write report programs that even non-programmers are using.

What it can do for your programmers.

Basically, it frees them of clerical details. Quickly. It can reduce programming time by 70% and more time to a minimum. For example, complete Cobol data divisions are generated with a 70% saving of programmer time.

MIRACL/CPG also provides automatic documentation and error checking while generating an errorless Cobol

compile the first time.

A complete system.

MIRACL/CPG will reduce your scheduling problems while increasing programmer productivity. It reduces turnaround time. And helps you meet management deadlines.

Already proven.

Republic supplies you with all you need to put MIRACL/CPG to work in one day. The software, installation, on-site training, and maintenance. In fact, you even get a "hotline" to Republic's Customer Service Department, to help solve any application problem that might arise.

Free demonstration.

MIRACL/CPG has been developed and tested for over two years. And since early last year and has since been used by customers to write hundreds of programs. So it's already "debugged." And Republic, one of the major consulting firms in the field, stands behind it.

No competition.

MIRACL/CPG offers a combination of important features never before available. Like our ten file input/output capacity, complete file management, and full Cobol compatibility. MIRACL/CPG produces more program with less coding.

Free demonstration.

We invite comparison. So we'd be delighted to run a free test of MIRACL/CPG for you. At your location. On your machine. Once you see it in action, you'll be amazed at its power.

For a further discussion of the MIRACL/CPG system, return the coupon below.



The MIRACL/CPG System by Republic.
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Republic	
SOFTWARE PRODUCTS INC.	
715 Park Avenue, East Orange, New Jersey 07017.	
□ Please send me more information about MIRACL.	
□ I am interested in a demonstration. Please have a representative contact me.	
Name: _____ Title: _____	
Company or Organization: _____ Phone: _____	
Address: _____	
City: _____ State: _____ Zip: _____	
Computer Model: _____ Core: _____	
Operating System: _____	

Contracts

A \$2.5 million hardware/software contract has been awarded to Scientific Resources Corp., of Philadelphia, by Globe Business Sciences, Inc., Midland, Texas. Under the joint development program and marketing agreement, new seismic software developed by Globe would be marketed exclusively by Scientific Resources, and advanced systems concepts would be implemented by personnel of both organizations.

RCA is building a computer designed to meet government requirements for an airborne command post from which missiles and aircraft could be directed and controlled without being destroyed. The Model 215 multiprocessor is suited for rugged military applications, and can operate over a wide temperature range.

The American Business and Commercial Life Insurance Co. of Dallas recently signed an electronic data processing facilities management contract with Computer System, Inc., also of Dallas. The two companies are planning to introduce a new application of electronic data processing to the insurance industry.

KMS Technology Center, a division of KMS Industrial Art, Inc., has been selected by NASA to handle data processing and analysis services at the National Space Science data center located at Goddard Space Flight Center, Greenbelt, Md. The contract is for one year at an estimated cost of \$1.5 million, with options for two successive one-year periods. During this time KMS will provide the necessary technical personnel and experience to manage systems operations for the NASA center.

Goodway Copy Centers, Inc., has awarded a contract for the design of a total financial information system to Franchise Business Systems, a division of Computer Conversions, Inc. of Jenkintown, Pa. The system being developed will provide automated control over the accounting and financial reporting functions for each individual franchise and for the investor-owned and company-owned copy centers. Investors will receive weekly and monthly reports showing sales, receipts, expenses, and the financial status of their operations. In addition, summaries of the statistics as well as exception reports will be provided to point out special trends and highlights.

Princeton Time Sharing Services, Inc. of Princeton, N.J., has disclosed the fulfillment of a contract agreement with TCR Services Inc. of Englewood Cliffs, N.J. In the initial phase of the contract, PTSS assisted TCR in developing a set of proprietary computer programs that provide a means for retrieving information about more than 500,000 trademarks. PTSS also maintains and services TCR's trademark retrieval system, which consists of over 1/2 million records of about 300 characters each.

Under a \$2 million contract, Tracer Computing Corp. of Austin, Texas, will supply Honeywell Inc. for five years for all of National Western Life Insurance's data processing and computer activities, including systems consulting, planning, design, implementation, and operation.

Informatics Inc. of Sherman Oaks, Calif., has been awarded a contract from the Department of Transportation to develop a basis for a standardized data processing system for commodity description and coding system. Informatics will gather information for developing a common description and coding system to facilitate the interchange of commodities between different forms of transportation.

National Data Communications Contracts Honeywell, Raytheon for \$56.3 Million

LAS VEGAS - National Data Communications of Dallas has signed a contract totaling \$56.3 million with Honeywell Inc. and Informatics Co. to supply computer and communications equipment for controlling its hospital management systems. It is believed the largest such purchase ever made for communications data processing use.

Thomas W. Butler, chairman of the board of NDC, said the Honeywell contract, which amounts to \$36.8 million, is for 94 modified Model 516 computers, 50 high-speed printers, and 500 disk-drives, each capable of storing up to 9.4 million characters of information. The agreement with Raytheon is for

\$19.5 million of specialty designed CRT units.

National Data will take delivery of the first of 47 systems in April, with final completion date scheduled for June 1971. The contract brings to 50 the number of systems ordered from Honeywell, including three systems on an earlier contract.

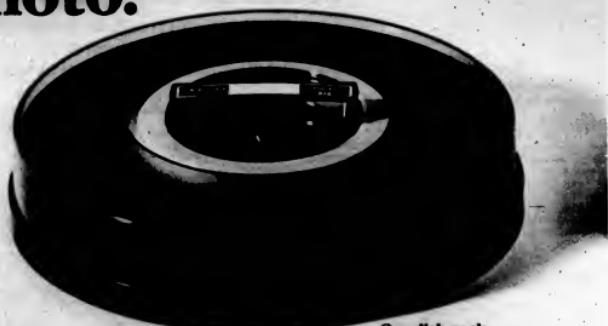
The equipment will be used to make up 50 real-time electronic access communications for hospitals (Reach) systems. They will control patient scheduling, inventories, and scheduling of administrative hospital services.

The Raytheon contract, which will supply cathode ray tubes, controls and test instruments is

"the largest single contract for digital display terminals," said Dr. Joseph F. Shea, vice-president and general manager of the Raytheon equipment division. The duty-station terminals are the only instruments used by hospital personnel in operating the Reach system.

National Data will begin taking delivery of the previously ordered systems early in December. Each Reach system, which includes two Model 516s and a large number of CRT terminals, will be brought to operational status at Honeywell facilities in Massachusetts before delivery to its assigned hospital.

Unretouched photo.



Our disk pack.

Acquisitions

Elpac, Inc., Irvine, Calif., and three other firms have completed agreements in principle under which Elpac has, or will acquire subject to further approval of directors, the respective assets of each firm. The firms are: Basin Oil Estates, Inc., a state of Washington-based real estate and property management firm; Montfar Oil and Gas Corp., a West Virginia firm; and Eastern Basin Oil and Gas Co., a West Virginia natural resource firm. Elpac is an electronics firm that plans to expand further into the computer field.

Foto-Mem, Inc., Natick, Mass., has purchased Washington Computer Sciences, Inc. at a cost of 10,000 shares of Foto-Mem

common stock, \$200,000 in cash, and the assumption of some limited liabilities. Foto-Mem is a small computer manufacturer that offers a line of computer peripheral hardware and systems.

Resource Management International of Amarillo, Texas, a holding company specializing in the management of agriculture resources, has agreed in principle to purchase International Agri-Venture from Computer Utilization Inc. of Austin, Texas. International Agri-Venture is a wholly owned subsidiary of Computer Utilization Inc., a computer and management consulting company.

University Computer Co. of Dallas, Texas, a computer services organization, has acquired Computer Data Sciences Inc. of Cleveland, Ohio. Terms of the transaction were not reported. Computer Data Sciences specializes in computer programs and operating systems, and the development of a cathode ray tube typesetting service for the printing and publishing industries.

Information and Communication Applications, Inc., Silver Spring, Md., has purchased facilities of Data Power of New Orleans, a data conversion facility, for an undisclosed combination of stock and cash.

Orders and Installations

Three data terminals from Computer Consoles, Inc. (CCI) have been leased by Applications Technology, Inc., and Electronic Accounting Systems of Rochester, N.Y. Electronic Accounting Systems will use the CCI equipment in the implementation of a new payroll system that is being developed by Applications Technology.

Under a \$1 million contract, a large quantity of Varian R-622 ruggedized digital computers, from Varian Data Machines, have been selected as the process control computers for the V-1000 atomic test system. Their function is to control automatic test equipment that is used to perform troubleshooting procedures on avionic equipment by

automatically isolating a fault down to the module level.

Applied Logic Corp., a time-sharing company with headquarters at Princeton, N.J., has ordered an IBM 2314 disk file system. The \$1.5 million system will offer high-speed performance to users on Applied Logic's A/C/On time-sharing network.

The Danish Post Giro, the personal banking service operated by Denmark's Post Office, will enable three million Danish citizens to pay income taxes by payroll deduction, through the use of a large-scale computer-controlled, on-line system. The electronic retinae comprising reader, ordered from AB Recognition Equipment Industrial, a Scandinavian subsidiary of Recognition Equipment, will handle the processing of the income taxes and other transactions.

The Gerber Scientific Instrument Co. of South Windsor, Conn., has installed the first of its 1275 automatic pattern generating and drafting systems at International Computer Graphics, Inc., Dallas. The main application of the new Gerber system is computerized grading of patterns and the production of full-size markers and minimarkers for the garment industry.

A Sigma 7 system, manufactured by Xerox Data Systems, has been installed by Davis Computer Systems, Inc., New York, to expand its computer service capabilities. The system is now available to users in the New York metropolitan area for remote interactive batch processing and on-line resource sharing, through telephone connections from high-speed terminal devices in user offices, plants, and laboratories.

The Institute of Medical and Veterinary Sciences of South Australia has installed a Control Data 1700 for use in automating its pathology operations. The main function of the system will be to supply analytical data on specimens submitted by hospitals, clinics, and doctors.

The City of Buffalo has ordered a medium-scale CE-415 information system that features direct re-entry capabilities through a DRD-200 optical character reader. The automated re-entry of computer-generated documents will speed up data processing operations of the city significantly.

A \$400,000 Burroughs B300 computer system has been installed at the Millikin National Bank of Decatur, Ill., to handle general accounting operations.

Computer Transceiver Systems Inc. has added its first production-line Executive 300 to Med Johnson Laboratories in Evansville, Ind. Med Johnson has publicly announced plans to market a computer assisted diagnosis in the pediatrics program which will utilize the data communications terminal as the input/output instrument.

Need we say more?

We'd better, or we're in trouble. There really isn't much difference in the way disk packs look. That's logical. Ours are made to work on CDC drives as well as IBM 1311, 2311, 2314 and their equivalents.

But, before you lump all disk packs together, let your computer take a look.

Quite a difference. CDC disk packs are designed by computer people for guaranteed performance. That's the way they're made — with critical tolerances, uniform coatings, absolutely smooth surfaces. You (and your computer) know when you put one on the drive that it will perform perfectly. And, you know when you pull it off, it won't stick.

CDC disk packs have a predicted usable lifetime of five years. If you buy something that's going to be around that long, it better be good.

They are available for pur-

chase or lease in six-high or eleven-high models. Recording densities range from 2,000,000 to 32,000,000 characters.

GOT A TEST PROGRAM?
We have a disk pack. Compare it with the performance you've been getting. You'll see the difference.

Write us today. We'll send you all the details, and put you in touch with a Control Data computer supplies specialist near you.

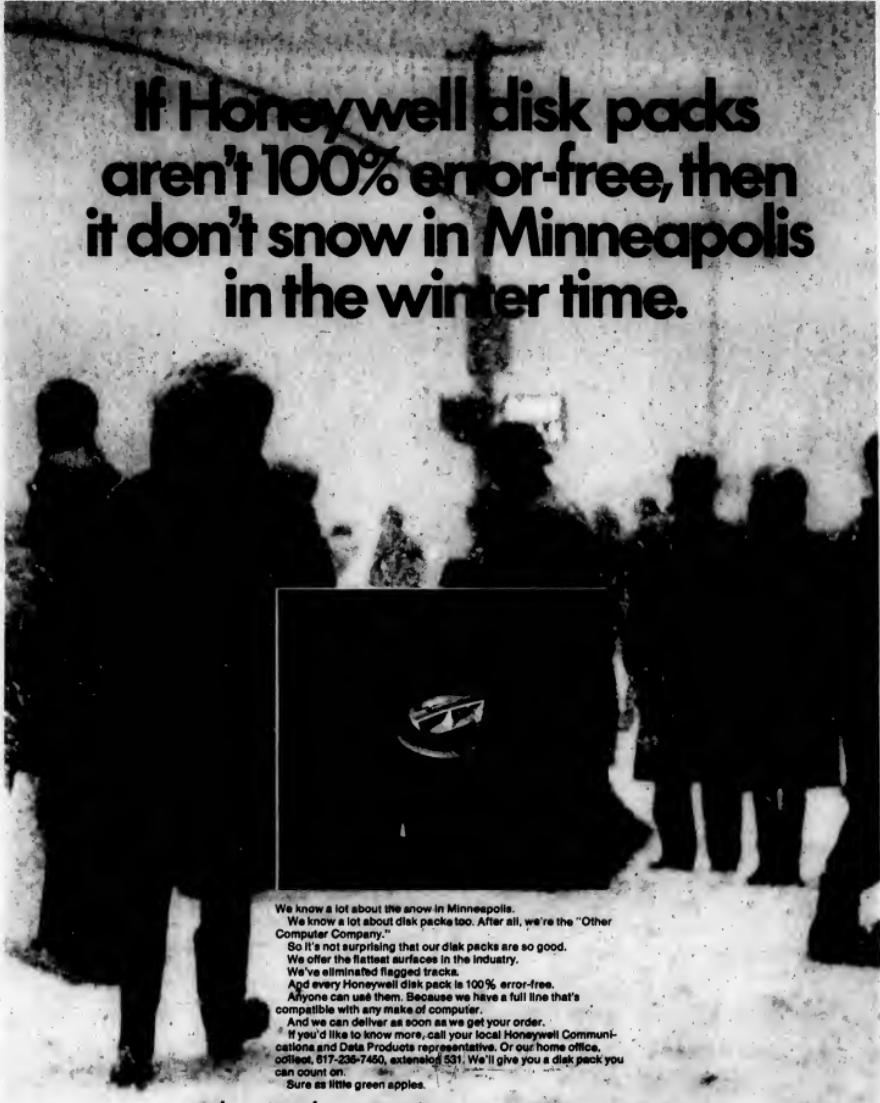


CONTROL DATA

Business Products Group
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Control Data Corporation
4570 West 77th Street
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If Honeywell disk packs aren't 100% error-free, then it don't snow in Minneapolis in the winter time.



We know a lot about the snow in Minneapolis. We know a lot about disk packs too. After all, we're the "Other Computer Company." So it's no surprise that our disk packs are so good. We offer the flattest surfaces in the industry. We've eliminated flagged tracks. And every Honeywell disk pack is 100% error-free. Anyone can use them. Because we have a full line that's compatible with any make of computer. And we can deliver as soon as we get your order. If you'd like to know more, call your local Honeywell Communications and Data Products representative. Or our home office, collect, 617-236-7450, extension 531. We'll give you a disk pack you can count on. Sure as little green apples.

The Other Computer Company:
Honeywell

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Earnings Reports

ALPHANUMERIC, INC.
Three Months Ended Sept. 30
1969 1968
Shr End 18,011 18,011
Revenue 901,955 282,231
Earnings (Loss) 38,333 (341,614)
a-On a fully diluted basis.

ARIES CORP.
Three Months Ended Sept. 30
1969 1968
Shr End 8,081 1,328,000
Revenue 1,328,000 1,328,000
Earnings 67,731 1,328,000
a-Not available as the company has changed from a calendar year to a fiscal year ending June 30.

ASTRODATA INC.
Three Months Ended Sept. 30
1969 1968
Shr End 8,07 1,328,000
Revenue 6,382,000 5,654,000
Earnings 1,040,000 (12,000)
b-Ms Shr 6,12 1,328,000
Revenue 10,390,000 10,343,000
Earnings (Loss) b548,000 (191,000)
a-Based on income before tax credit; b-Equal to 14 cents a share in the quarter and 24 cents a share in the six months.

BANISTER CONTINENTAL CORP.
Six Months Ended Sept. 30
1969 1968
Shr End 8,28 1,328,000
Revenue 14,765,000 1,824,000
Earnings 652,000 173,000
a-The report states that, assuming full dilution, share earnings were 26 cents in the 1969 period and 10 cents in the 1968 period.

CALIFORNIA COMPUTER PRODUCTS
Three Months Ended Sept. 29
1969 1968
Shr End 8,08 1,328,000
Revenue 4,985,376 4,333,566
Earnings 893,768 34,489
a-Based on income before tax credit; b-Reported in month of interest in 1968.
b-After \$99,240 deduction for the company's share of this quarter's losses by an affiliate formed in Oct. 1968.

COMPUTER LEASING CORP.
Nine Months Ended Sept. 30
1969 b1968
Shr End 84,44 8,47
Revenue 2,329,000 2,358,000
Earnings 1,020,000 1,020,000
a-Based on average common share held in month of interest in 1968.
b-Common share equivalent as reported by the company; b-Reported to reflect acquisitions made on pool-of-interest basis.

Position Announcements

DATA PROCESSING MANAGER FOR STUDENT LOAN PROGRAM

Rapidly growing program offers a challenging opportunity. Computer data management, problem-solving ability. Experience in systems and programming as well as 3rd generation equipment using Cobol. Outstanding background helpful. Salary commensurate with background and experience. Excellent fringe benefits.

Send confidential resume to: Elwood O. Hollister, Executive Director, New York Higher Education Student Loan Corporation, 155 Delaware Avenue, Delmar, New York 12054

COMPUTER USAGE CO.

Year Ended Sept. 30

1969 1968

Revenue 11,466,502 13,610,996

Spec Cred 452,605

Loss 1,536,886 432,436

a-Gain on sale of property.

DATA MATION SERVICES, INC.

Nine Months Ended Sept. 30

1969 a1968

Shr End 8,11 9,08

Revenue 11,167,161 8,17

Earnings (170,615) 184,958

b-Reflected the acquisition of CSECO on July 1, 1968, on a pool-of-interest basis. This report is unaudited.

ELECTRONIC COMPUTER PROG. INST.

Nine Months Ended Sept. 30

1969 1968

Shr End 8,08 8,08

Revenue 2,341,160 2,645,592

Spec Cred 43,970

Earnings 43,970 b434,904

a-Based on income before special credit; b-Equal to 57 cents a share.

FIMACO, INC.

Nine Months Ended Sept. 30

1969 1968

Shr End 8,04 8,04

Revenue 1,468,010 1,367,771

Earnings 25,349 22,225

a-Comparable figures not available.

VERMONT RESEARCH CORP.

Year Ended Sept. 30

1969 1968

Shr End 8,39 8,70

Revenue 4,183,795 2,244,041

Earnings 231,650 46,732

a-Reported on income before special credit; b-Reported as net of building c-Equal to \$1.06 a share.

LEWIN TOWNSEND COMPUTER

Six Months Ended Sept. 30

1969 b1968

Shr End 8,04 8,04

Revenue 33,312,572 22,993,389

Spec Cred 3,594,690

Earnings 43,970 b19,759

a-As reported by company and based on common and common share equivalents; b-Reflected for the acquisition of a 50% interest in a company purchased as of Aug. 1, 1965, and Russell M. Tolley & Associates, Inc., acquired as of Aug. 1, 1966, and sold on Oct. 1, 1964; reflected on income before special credit; b-Net gain on sale of investments; c-Equal to \$1.06 a share.

HATHAWAY INSTRUMENTS, INC.

Three Months Ended Sept. 30

1969 1968

Shr End 8,14 8,11

Revenue 1,281,129 1,157,197

Earnings 113,674 77,201

a-Reported on income before special credit; b-Net gain on sale of investments and to \$1.52 after such gain.

BARNES CORP.

Three Months Ended Sept. 30

1969 1968

Shr End 8,10 8,10

Revenue 891,876 646,633

Earnings 48,707 48,707

a-Reported on income before special credit; b-Net gain on sale of investments and to \$1.52 after such gain.

PROGRAMMER

WE'LL BET YOU \$13,000 YOU'LL DO GREAT WITH US!

That's the salary range we'll pay you if you are qualified to work with our new computer system. We are planning to expand. If you have a minimum of 1 year application or systems programming, OS/360 experience, and know assembler language, you may be the one we're looking for. Your responsibilities will include converting operating system from OS/360 to OS/360 in the development of systems or application programs. We're looking for a person with a strong desire to work with us. We have a company that is growing fast and need another good man on our team. If you think it could be you, send your resume in complete confidence to:

Mr. Anthony Spallone, Personnel Director
SHARED MEDICAL SYSTEMS
Ross and Royal Rds.
King of Prussia, Pa. 19406

PROGRAMMER-SYSTEMS ANALYST

Manager for new department. Charged with responsibility of implementing management system for modern 265 bed general community hospital. Candidates must have business administration degree or equivalent and one to two years experience as systems analyst or programmer. Contact Mr. W.J. Vanderschaff, Personnel Director, Sewickley Valley Hospital, Sewickley, Pennsylvania.

New Registrations

ADVANCED COMPUTER SOFTWARE SERVICES, INC. 100 Broad St., New York, N.Y. 10003, a company that intends to become a leading supplier of software, data processing systems, proprietary program development, and data processing consulting services. The company will be a wholly owned subsidiary to a corporation to be formed to operate a facility in Puerto Rico to manufacture and market the physical and logical components of proprietary software products for the company's own purposes and for other corporations.

The underwriter is First Securities Corp., 100 Broad St., New York, N.Y. 10006.

VACTRON COMPUTER SYSTEMS CORP. Bedford, Mass. 01730, a company engaged in the design, development, assembly, and marketing of data processing systems, including a line of variable subordinated debentures, due in 1970, of \$1,000,000 of common stock, \$1,000,000 of common stock, \$1,000,000 of debentures, and \$1,000,000 of equipment leased to customers; to purchase machinery and equipment; to lease office space; for the payment of interest on the debt; and for the payment of interest on the debentures. The underwriter is First Securities Corp., 100 Broad St., New York, N.Y. 10006.

Q.
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Look to Bendix.

Expansion of the Digital Computer Laboratory due to new contracts has created a need for:

DIGITAL COMPUTER DESIGN ENGINEERS

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Digital Computer Architecture Electronic Design, Magnetic and Semi-Conductor Memories, Analog/Digital Converters, Digital/Analog Converters, Computer Input/Output Systems, Electronic Packaging, System Software Development, and Assembly Language Procurement.

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The Bendix Corporation

Navigation and Control Division

Teterboro, New Jersey 07608

Bendix

Navigation & Control Division

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Charles E. Frasier Heads Staff at ISD

KANSAS CITY, Mo. — Charles E. Frasier has been appointed president and chief executive officer of Information Systems Development, Inc., a recently formed management information systems company.

Frasier started his computer-based management career with RCA in 1957. At RCA he progressed to Kansas City district systems representative. He also gained additional sales and management experience in 1964 with Honeywell.

Frasier is currently director of computer systems for Black, Sodalis & Bryson, Inc., of Kansas City, will head a staff of over 35 ISD computer management consultants and specialists.

Information Systems Development, Inc. is an independent firm that offers services in the formulation, development, and implementation of computer-based management information

systems.

ISD services include management consulting, installation management, design, development and implementation of management information systems; state and local government

management systems; urban and regional planning; information systems, application packages; real-time process control; and surveillance; computer-based social science research and other planning studies.

Kuemmerle Joins IRC as President

NEW YORK — John F. Kuemmerle has been elected president and also a director of Installation and Research Corp., an electronic data processing company that offers, among other services, a computer output microfilm system for the conversion of data information directly from magnetic tape to film.

Kuemmerle succeeds Aaron Lieber as the company's president.

Prior to joining Installations and Research, Kuemmerle was a vice-president of the J. Henry

Schroder Banking Corp. and the Schroder Trust Co. Previous to that he was a director of systems and data processing for the American Express Co., and a corporate manager of systems at Metcalf & Co., Inc.

He is on the board of directors of Northwest Electronics Co. and St. Anthony Printing Co., and recently resigned as a member of both the board and the executive and finance committee of Randomic Data Systems, Inc., of Trenton, N.J.

Konkel to Serve

ISL as Chief Executive

JENKINTOWN, Pa. — Paul F. Konkel has joined Information Systems Leasing Corp. as executive vice-president and general manager, and will serve as chief executive officer of the corporation.

Konkel has an extensive background in the data processing industry, including experience in systems design and development, facilities management, and marketing. He has been in the EDP field for some 14 years.

He had been district manager in the New York area for Computer Usage Corp. prior to joining Information Systems Leasing Corp.

Information Systems Leasing Corp., headquartered in the Philadelphia area, provides a large range of data processing products and services.



EDPeople

Digicon Advances 3 VPs

HOUSTON, Texas — Digicon, Inc. has advanced vice-presidents Patrick H. Poe and Edward R. Sherwood, Jr. to senior vice-presidents, and named Roland Lamm and John Sherwood vice-presidents.

In his new position, Poe will be in charge of computer operations for the Houston-based geophysical company. He has been engaged in work with computers for the last 10 years, specializing in seismic and geophysical applications.

He is one of the founders of Digicon, and was responsible for the development of the company's seismic digital data processing system.

Poe will direct all field operations for Digicon. He has been involved in geophysics since 1960, and has had wide experience in field operations.

Roland Lamm, former manager of South American operations, will enlarge his area of responsibility to include the Far East, Australia and Latin America. He joined Digicon in 1969.

Prior to this association he had 15 years experience in geophysics with Standard Oil Co. of Calif.

John Sherwood joined Digicon earlier this year as a senior scientist. He came to the company from Chevron Oil Field Research Co. where for 11 years he was senior research associate in geophysics.

Krumbach Joins Data Devices Div. of Astrodata

ANAHEIM, Calif. — Gustav Krumbach has been appointed senior design specialist for Astrodata's data devices division. Prior to joining Astrodata,

Krumbach was project manager of Raytheon Computer Co. in Santa Ana and Los Angeles. Earlier he was project engineer for Benson Lehner Corp.

Executive Corner

At Raytheon he directed a program to design a computer-processor system for the Times-Mirror Press and earlier in Germany developed the logic design for the first transistorized computer in Germany, the FR56.

Astrodata's data devices division was organized in Dec. 1968, to develop and market computer peripheral equipment for the electronic data processing field.

Other Moves

International Data Corp., Newton, Mass., has appointed Walter E. Midson as director for industry analysis. He will provide interpretation and forecasts from a worldwide data base on computer installations maintained by IDC.

ASC Tabulating Corp., Lake Bluff, Ill., has announced the election of Mel Jacobs as a vice-president of the corporation.

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